

FIRST AERO WEEKLY IN THE WORLD

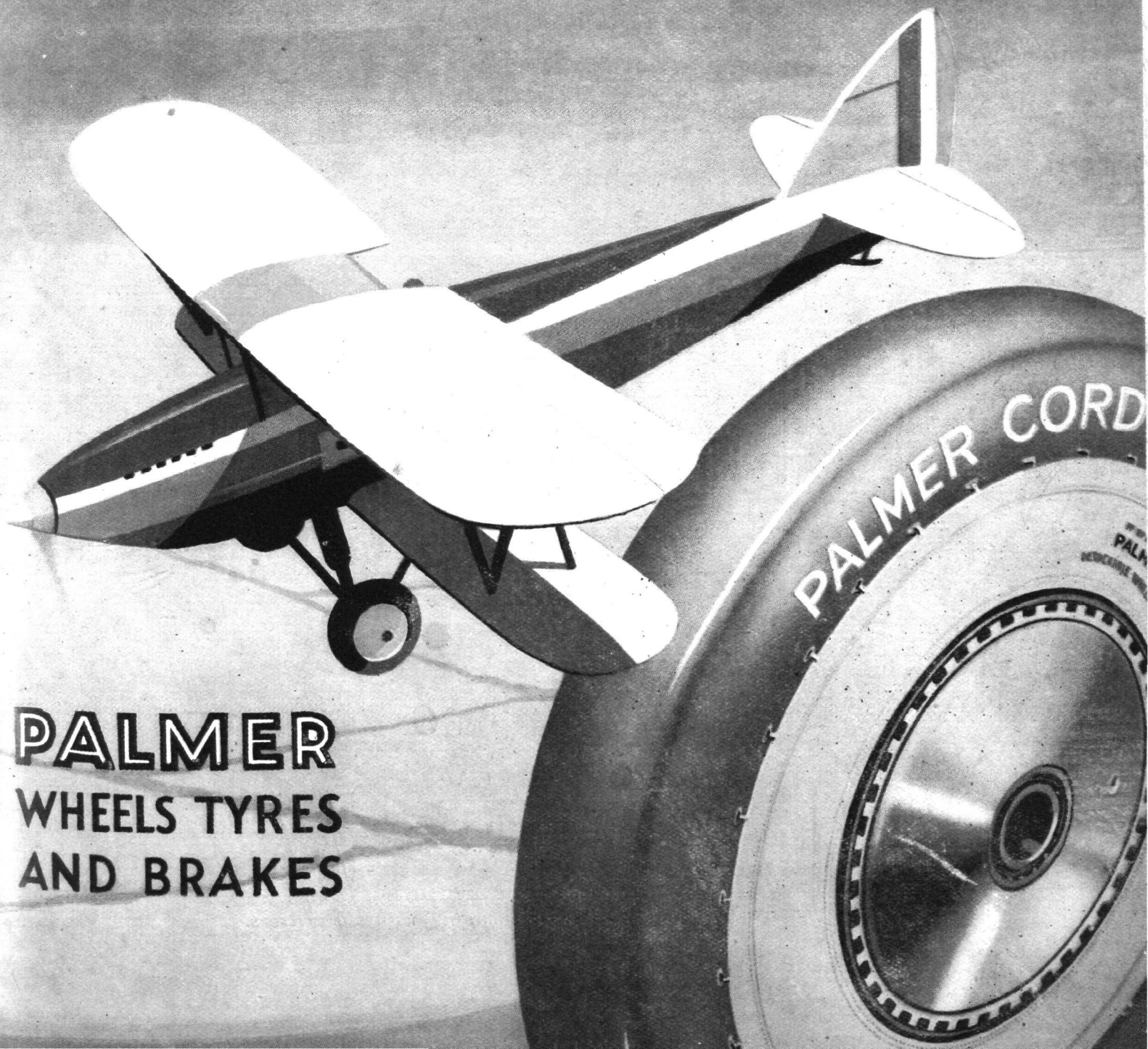
FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

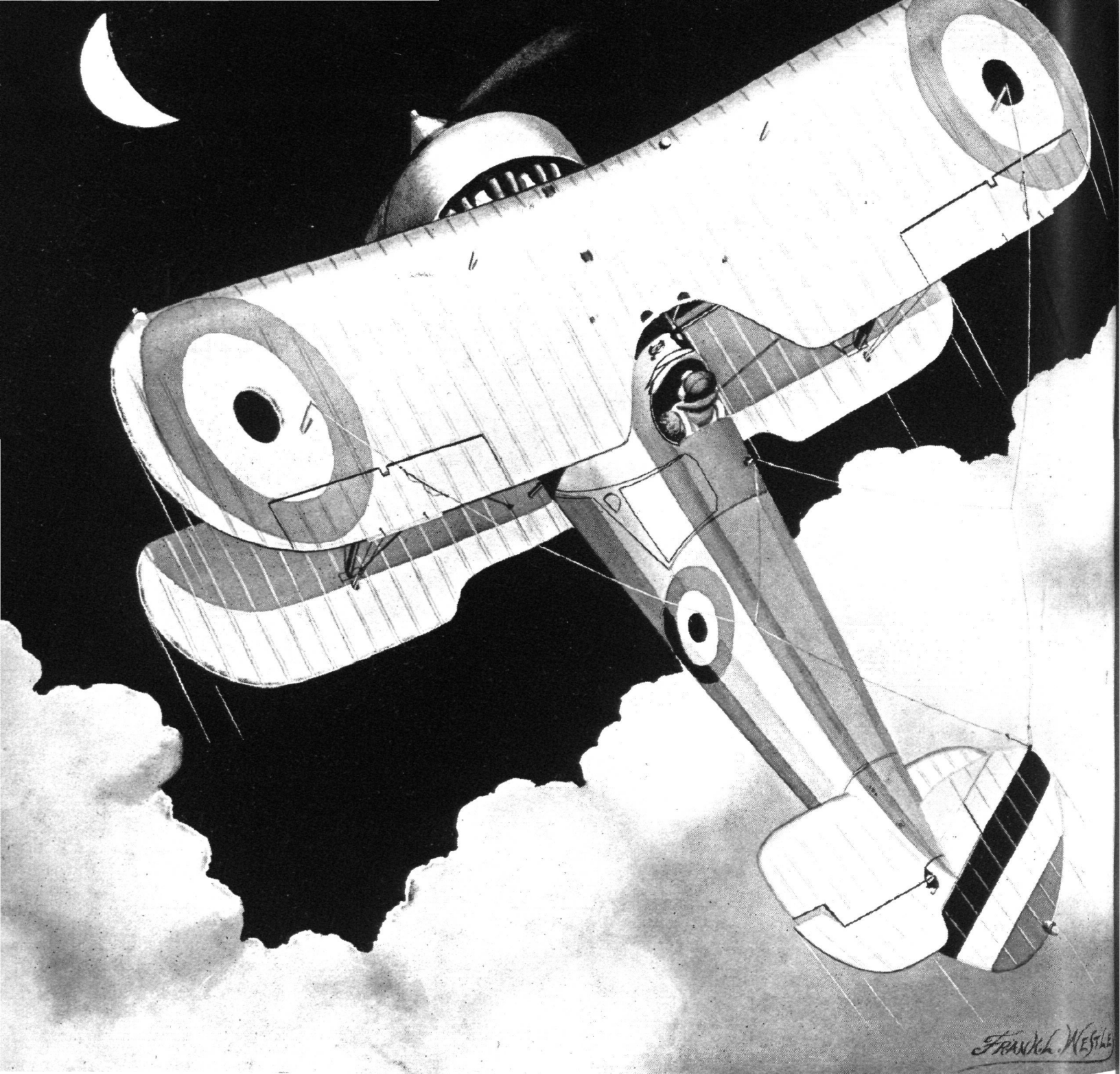
No. 1282
Vol. XXV
No. 29

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

SIXPENCE
EVERY THURSDAY



PALMER
WHEELS TYRES
AND BRAKES



Bristol
BULLDOG
DAY AND NIGHT FIGHTER.

Designed and Constructed by

THE BRISTOL AEROPLANE CO., LTD.,
FILTON - - - - - BRISTOL.

Kindly mention "Flight" when corresponding with advertisers.

ELEMENTS of Efficiency in Aircraft..

Standard forms of B. A. Co. aluminium include alloy ingots and notched bars for cylinders, cylinder heads, pistons and crankcases. Sheets for cowl-ing, fairings and panelling. Alloy rod for all turning purposes. Sections. Tubes. Rivets. Bars. Wire. Powder.

ALUMINIUM AND LIGHT ALLOYS

THE BRITISH ALUMINIUM CO. LTD.,
ADELAIDE HOUSE, KING WILLIAM STREET, LONDON. E. C. 4.
TELEPHONE: MANSION HOUSE 5561 & 8074 (5 LINES) TELEGRAMS: CRYOLITE, BILGATE, LONDON.

Fl.20.7.33.

SAFETY



Any open space from a 5-acre field to an airport will serve the Autogiro pilot.

Travelling by air, swiftly and in comfort, he can choose his own cruising height without worry—without anxiety, as to suitable ground in the event of a forced landing.

For the Autogiro can be "put down" with safety on ground and in a space that would be impossible to orthodox types.

The latest development, the Direct Control Model, ensures absolute flying simplicity with safety, and the general performance has also been greatly improved, so that it represents the ideal practical aircraft for the business and private owner.

(AERODROME: LONDON AIR PARK, HANWORTH. Telephone: Feltham 236).

Full particulars from:—

THE CIERVA
AUTOGIRO

BUSH HOUSE, ALDWYCH, LONDON. W. C. 2

Telephone: Temple Bar 2561.

Save time by using the Air Mail.



KING'S CUP
AIR RACE

AGAIN WON WITH A
FAIREY
METAL AIRSCREW

**35 Competitors — 25 FAIREY METAL AIRSCREWS — WITH
100% RELIABILITY**

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1282. (Vol. XXV.) 25th Year.
No. 29.

JULY 20, 1933

Weekly, Price 6d.
Post Free, 7½d. Abroad, 8d.

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone: (2 lines), Holborn 3211 and 1884.

Telegrams: Truditur, Westcent, London.

Subscription Rates, Post Free.

UNITED KINGDOM		UNITED STATES		OTHER COUNTRIES	
	s. d.				s. d.
3 Months ..	8 3	3 Months ..	\$2.20	3 Months ..	8 9
6 " ..	16 6	6 " ..	\$4.40	6 " ..	17 6
12 " ..	33 0	12 " ..	\$8.75	12 " ..	35 0

CONTENTS

	PAGE
Editorial Comment:	
Mails from Calcutta ..	715
750 Hours ..	716
Imperial Reliability ..	716
The Helicopter ..	717
Handley Page "Heyford" ..	718
Air Transport: Report on Civil Aviation ..	721
Royal Air Force Staff College ..	723
Airisms from the Four Winds ..	727
Airport News: Cork as a Terminal Airport ..	729
From the Clubs ..	731
The Angers "12 Hours Contest" ..	734
Flying Doctor in Australia ..	735
An American Four-Seater: The "Waco" ..	737
Correspondence ..	738
Electro-Deposition of Metal ..	739
The Air Exercises ..	740
Royal Air Force ..	741
R.A.F. College, Cranwell ..	742



EDITORIAL COMMENT

HIS week the incoming mail plane from India brings letters which have flown straight from Calcutta. That is an event of very great importance in the history of Empire communications. On another page we give a *résumé* of the report on the progress of Civil Aviation in 1932, from which it appears that the total weight of letters carried on the India service amounted to 60,000 lb. during the year. It was a substantial improvement on the figures of the previous year, but if anyone were to adopt the methods of the Auditor General of the Australian Government, take the total expenditure of Imperial Airways, or the total amount of subsidy paid to them, and work out the cost of carrying each letter to India (disregarding all other aspects of the work of Imperial Airways), we might arrive at a very shocking figure. In short, the air-borne correspondence between Great Britain and India, though increasing in bulk every year, is still disappointing.

If, on that account, we were to be asked the old war-time question, "Are we downhearted?" our answer would emphatically be in the negative. The steady growth of the volume of mails alone would forbid such a frame of mind. Apart from that, we have always recognised that an air mail service which came to an end at such a place as Karachi would never be able to attract a large volume of correspondence. An extension to Delhi could do little to improve matters. Delhi is mainly of political importance. The Tata air line improved matters considerably by extending the air service to Bombay and Madras, the second and third most important commercial cities in India, but that extension was not begun until after the monsoon was over, that is to say in October, and so it made little difference to the volume of air-borne mail for last year. Even if it is very useful and meets a long-felt want, a new air service must always take some time before it wins popularity with the public. It will be interesting to study the effect of the Tata service in next year's report.

The thing needed above all others to make the air

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1933.
- July 22. Official Opening of Maidstone Airport and Ae.C.
 - July 22-23. Cinque Ports Club Flying Meeting.
 - July 22. Cardiff Ae.C. Annual Air Pageant, Splott Aerodrome.
 - July 22-24. International Rally on the Belgian Coast.
 - July 24-28. Lawn Tennis: R.A.F. Championships, Hurlingham.
 - July 26. Inter-Services Athletic Championships, Portsmouth.
 - July 31-Aug. 1. Lawn Tennis: Inter-Services Championships, Wimbledon.
 - July 31-Aug. 4. Lawn Tennis: Airmen's Championships, Halton.
 - Aug. 5. Maidstone Ae.C. All-Women's Air Rally.
 - Aug. 7. Scarborough Ae.C. Flying Meeting.
 - Aug. 12. London-Newcastle Race.
 - Aug. 13-20. International Gliding Competition, Wasserkuppe, Germany.
 - Aug. 19-20. 5th Annual Canadian Air Pageant, St. Hubert Airport, Montreal.
 - Sept. 1-4. International Air Races and Gordon Bennett Balloon Race, Chicago.
 - Sept. 9. Kent Air Pageant, Maidstone Airport.
 - Sept. 9. Essex Aviation Display, Maylands Aerodrome, Romford.
 - Sept. 16. Bristol and Wessex Ae.C. Garden Party.
 - Dec. 18-24. International Rally at Cairo and Meeting of the F.A.I.

mail service really useful to Indian commercial interests was that it should be carried straight through to Calcutta. This has now happened. Henceforth Karachi is no longer a terminus, but a mere junction, which is as it should be. Letters dated in Calcutta, Tuesday, July 11, were delivered in London on Monday, July 17. That is something which was really worth doing.

It is perhaps rather hard for people who have never lived in India to realise the great importance of the Home mails to the commercial communities in the three great Presidency cities, which are also the three greatest centres of commerce. The old method, on which Indian commerce flourished very well for many years, was for the mails to arrive at Bombay by P. & O. boat on Friday morning, and the Calcutta and Madras bags were then hurried across the sub-continent by mail train, which took about 30 hours to do the journey. The letters when they arrived were 16 or 17 days old. The Homeward mail steamer left Bombay on the Saturday of the following week, and letters had to be posted on the Thursday, so that the merchants of Calcutta and Madras had but the inside of a week in which to take action on the letters from their London offices and to write their replies. So important was the gain of a few more hours that the telegram-letter became very popular. This was wired from Calcutta to Bombay on the morning of the steamer's departure, and the Post Office in Bombay posted it as a letter on board the steamer. It was useful, but there was no privacy about it, and it was subject to telegraphic errors by clerks who were working in a foreign language. Now a private letter can get from Calcutta to London in less than a week. This is a very great step in advance, and as the business people grow accustomed to the use of the air mail—it must be recognised that even this great boon will only receive gradual recognition in a land largely governed by *dastur* or custom—the material benefits to commerce will be very great indeed.

❖ ❖ ❖ ❖

By a curious coincidence the last few days have seen repeated examples of the progress which flying has made since M. Louis Bleriot flew across the Channel 24 years ago, on July 25, 1909. General

**750
Hours** Balbo, the Italian Air Minister, and his gallant companions have successfully flown from Rome to Chicago in 24 Savoia flying boats via Holland, Ireland, Iceland, Labrador and Canada. The feat is one upon which the Regia Aeronautica is to be very heartily congratulated, and the whole British aviation community will rejoice at the success of our very good Italian friends. It was a particularly unkind stroke of ill-luck which resulted in damage to one of the 25 machines which originally set out from Italy and unfortunately not without loss of life, in a trivial mishap in Holland, but the nature of that regrettable accident was not such as to detract in the least from the merits of the flight as a whole.

Of a very different nature is the solo flight from New York of Mr. Wiley Post, who is at present on a flight around the world. FLIGHT does not approve of these landplane flights across wide stretches of ocean, but the long stages flown do afford evidence of the technical progress made in the design and construction of aeroplanes and aero engines. Blériot's flight across the Channel was distinctly worth while because the feat had never been accomplished, and because it foreshadowed the manner in which aircraft

were to span the seas. On July 25, 1909, Great Britain virtually ceased to be an island.

If we look back and try honestly to assess the progress made since Blériot's historic flight, it is inevitable that we must concede a great share of the honours to the aero engine manufacturers. Improvements in the aeroplanes themselves there have been, certainly. The modern all-metal aeroplane is a very different engineering structure from the "stick-and-string" contraptions which the early pilots flew. But very useful work could still be done on most of those early aeroplanes if they were fitted with modern engines. The reverse would not apply. The finest modern light plane built would be comparatively useless if fitted with the little 25-h.p. Anzani "fan" type engine which just managed to drag Bleriot across in 1909 but gave up almost before the English coast was reached. Overheating, plug troubles, lubricating troubles, mechanical breakages, all were not merely everyday occurrences, they happened every few minutes.

What a contrast is afforded by the announcement made this week by the De Havilland Company that the top overhaul of their "Gipsy Major" engines after 150 hours' running is now regarded as superfluous, and that complete overhauls, which have hitherto been deemed advisable after 450 hours' running need now be made only after 750 hours. Taking the cruising speeds of most aeroplanes in which the "Gipsy Major" is likely to be fitted at the low average of 100 m.p.h., we have 75,000 miles flown before the engine needs overhauling!

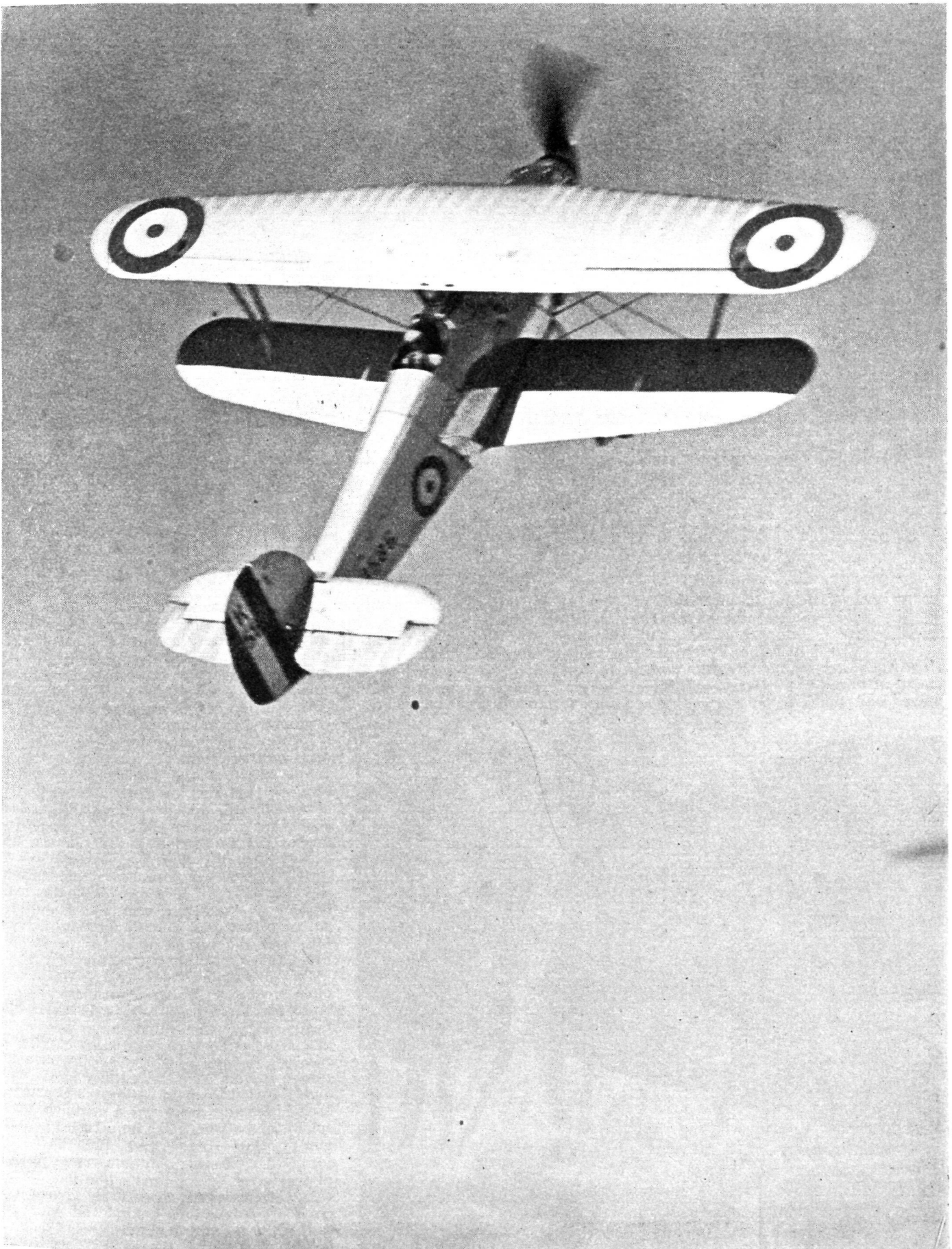
The De Havilland Company has not arrived at this very satisfactory stage except by dint of real hard work. For example, those in close touch with the company know that every week a meeting is held, at which the General Manager presides, and which is attended by the engine designer, the chief draughtsman, the chief inspector, the works manager and the experimental engineer. At these meetings letters from operators are carefully considered, particularly those containing complaints, and ways and means for effecting improvements are discussed. During the past seven years the firm has produced close upon 3,000 "Gipsy" engines, and the career of almost every one of these has been followed with considerable vigilance. Extensive racing experience, with large numbers of engines running for long periods at full throttle, has helped materially in weeding out any weak parts of the design. Everyone concerned is to be congratulated on the progress of which this De Havilland announcement bears evidence.

❖ ❖ ❖ ❖

Few of the figures in the statistics published in the Report on Civil Aviation in 1932 give cause for greater satisfaction than those showing the reliability achieved by Imperial Airways' routes. For the

Imperial Reliability	whole year 3,504 flights were scheduled on the European routes, and 3,280 were completed, 39 were not completed and 185 were cancelled. On the London-Egypt service 593 flights were scheduled and 593 were completed. On the Egypt-South Africa route 2,314 flights were scheduled and 2,304 were completed. On the Egypt-India service 995 flights were scheduled, all of which were completed. That, we submit, is a record of which Imperial Airways may well be proud, and which speaks well not only of the aeroplanes and engines used, but of the efficiency of Imperial's maintenance service.
---------------------------------	---

"EXCELSIOR"!



"THE HELICOPTER" : A Hawker "Super-Fury" (Rolls-Royce "Kestrel"), piloted by Mr. P. W. S. Bulman, doing a vertical climb above the clouds. As the machine had to cross the path of the "Hart" from which the photograph was taken, the relative movement was extremely fast, and to secure this picture the pilots had to show a high degree of judgment, while our photographer estimates that he had but a small fraction of a second in which to aim his camera and press the button. (FLIGHT Photo.)



"NOSE-ON" : This front view gives a good idea of the small frontal area of the "Heyford." (FLIGHT Photo.)

THE HANDLEY PAGE "HEYFORD"

(Concluded from page 670.)

HAVING dealt, in our issue of July 6, with the structural features of the Handley Page "Heyford" night bomber, we will turn to the finished machine, which presents many points of interest, caused mainly by the novel conception of the general arrangement of large components such as fuselage, engines and bombs. Hitherto the accepted formula for

night bombers, at any rate as far as Great Britain is concerned, is the biplane cellule with fuselage on the bottom centre section and engines on or but a short distance above the lower wing. This arrangement, which has served us well enough in the past, is open to criticism on several points, mainly in connection with the defensive armament, *i.e.*, the position of the machine gunners. The customary twin-engined night bomber has a forward gun position in the extreme nose and another gunner's position in the extreme stern of the fuselage. It will be obvious that the top wing, placed as it is a considerable distance above the fuselage, somewhat blankets the view and field of fire of the forward and rear gunner. In a rearward direction the machine is well protected by the gunner in the extreme tail, but it is not, perhaps, altogether satisfactory to have one member of the crew so far away, as communication between him and the rest is likely to be made a little difficult during a "scrap."

In the Handley Page "Heyford" a complete breakaway from the orthodox arrangement has been made by the designers. To begin with, the blind area above the machine has been eliminated by raising the fuselage to the level of the top centre section. In this way the gunner in the nose and the gunner behind the wings can see each other and can cover a complete hemisphere above the machine. Instead of the gun position in the extreme tail, the "Heyford" has a retractable gun turret just aft of the upper rear gunner's position. When this turret is let down, the gunner can cover the whole area behind and under the tail, while the upper gunner covers the area behind and above the tail. This feature was well brought out in the photographs which we published in our July 6 issue. As



WINDING THE ELASTIC : The starting equipment is removable, and is taken from one engine to the other. (FLIGHT Photo.)

Subject to official confirmation.

KING'S CUP AIR RACE SIDDELEY TROPHY WON

by
MR. A. HENSHAW
flying a Comper Swift (Pobjoy Engine)

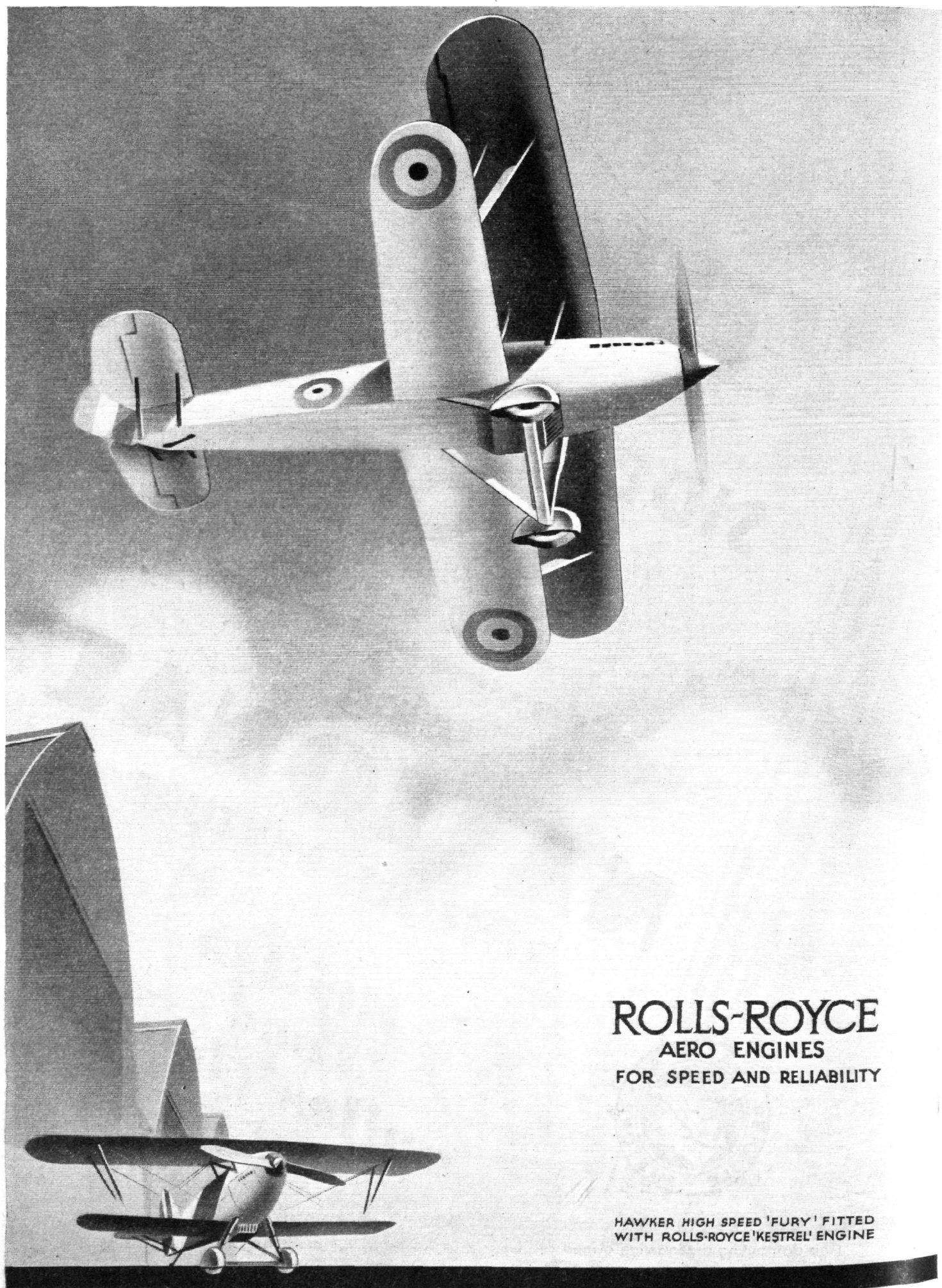
using
NATIONAL
BENZOLE MIXTURE

*British
and
'miles' better*



NATIONAL BENZOLE CO. LTD., WELLINGTON HOUSE, BUCKINGHAM GATE, LONDON, S.W.1
(The distributing organisation owned and entirely controlled by the producers of British Benzole.)

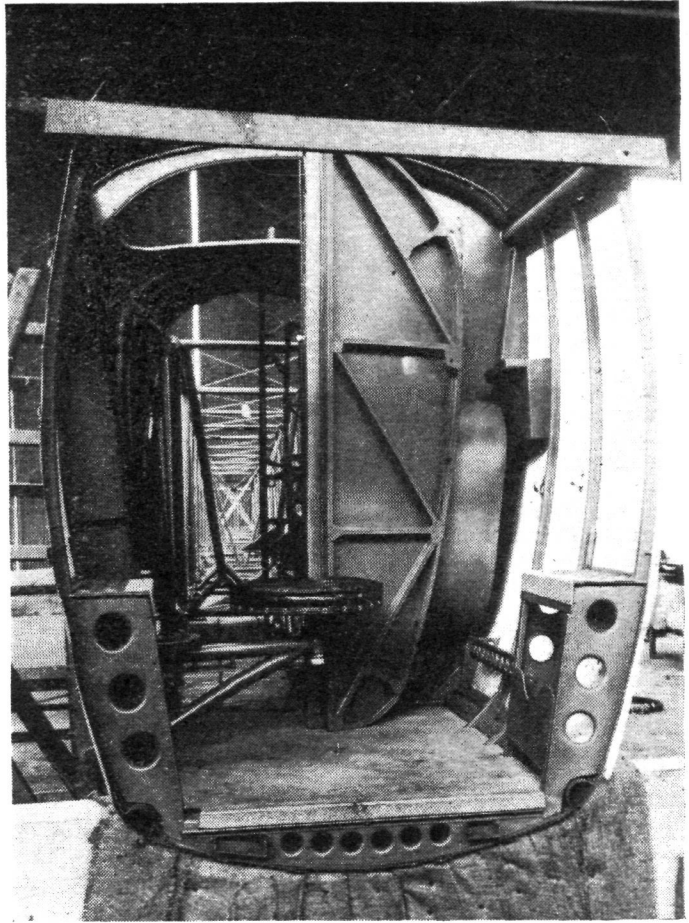
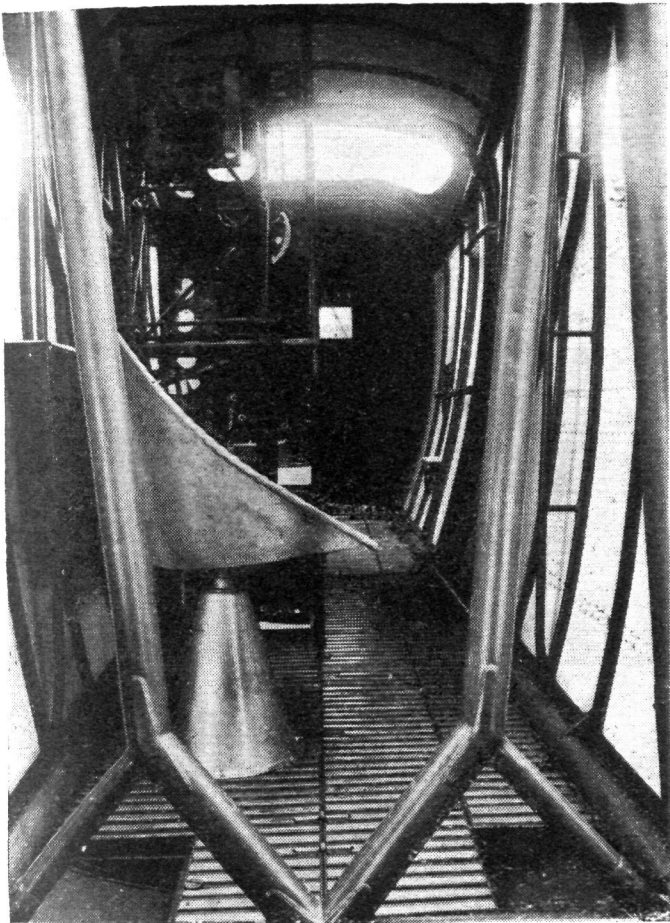
Save time by using the Air Mail.



ROLLS-ROYCE
AERO ENGINES
FOR SPEED AND RELIABILITY

HAWKER HIGH SPEED 'FURY' FITTED
WITH ROLLS-ROYCE 'KESTREL' ENGINE

Kindly mention "Flight" when corresponding with advertisers,
viii



INTERIOR VIEWS: These were taken before the machine was finished. On the left, the wireless compartment, looking forward. On the right, a view into the front gunner's compartment, taken before the nose cap was put on. Note the firing steps and the "piano stool" seat. (FLIGHT Photos.)

the interior of the fuselage is so arranged that members of the crew can walk from the retractable gun turret aft of the wings to the cockpit in the nose, communication between members of the crew is rendered much easier.

The placing of the offensive armament is also different in the "Heyford." All the large bombs are carried in the centre section of the lower plane, where they are out of the airstream and thus do not add to the drag, or at least only add to it to the extent that the centre section which houses them is rather thicker than the rest of the wings.

The resulting "cleanness" is reflected in a considerably enhanced performance (the "Heyford" cruises at something like 115 m.p.h.), which is further helped

by careful streamlining of the engine nacelles and by large "spats" over the wheels of the undercarriage.

The two Rolls-Royce "Kestrel" engines are, as already mentioned, close under the upper wing. The petrol tanks are situated behind the engines and so shaped as to form a tail fairing for the engine housings. The high placing renders the engines somewhat inaccessible, but light ladders of tubular construction hook on to fittings on the top front spar and are strutted at their lower ends into "keyhole" plates on the lower leading edge. The ladders can be placed in position in a few seconds, and the sides of the engine housing fold down to form platforms on which the engineers can stand while working on the engines. The landing wheels (Palmer wheels with brakes) are, as mentioned in our first

article, carried on forks, and are partly enclosed in fairings. In the upper rear part of each wheel fairing is a small door which gives access to the Ki-gass starter, starter magneto switch, and fuel and oil points. The machine is fuelled by attaching the tube from the pump to the fuel point in the wheel fairing. Ordinary filler caps are also provided in the tanks, on the left side of each engine, between the exhaust pipe and the upper wing. On top of each wheel fairing are supports for the vertical and horizontal shafts of the hand turning gear. These are not, of course, permanently attached, but can be shipped and unshipped in a few moments, and carried from one engine to the other.

The interior of the fuselage of the "Heyford" is reached via a small trap door in the floor, above the trailing edge of the lower centre section. On the vee struts which support the fuselage from the lower



THE PILLAR BOX: This is raised, lowered and rotated by the gunner himself. (FLIGHT Photo.)

TWIN RUDDERS AND MONOPLANE TAIL : The aerodynamic horn balances of the rudders are below the tailplane, while the mass balances are at the top. (FLIGHT Photo.)

plane are fitted steps which render access to the interior very easy. As one enters the fuselage through this trap door, the rear gunner's cockpit and the retractable gun turret are behind one, while ahead stretches the front part of the fuselage with, first, a large stowage compartment, then navigation and wireless compartment, pilots' cockpit, and finally, in the extreme nose, the forward gunner's compartment.

In the rear gunner's cockpit there is a tip-up seat on the starboard side, and all the usual gear used by a gunner, with ammunition drums on pegs, points for the electric heating of clothes, etc., and so forth. The floor of this compartment is slightly raised, and to the rear is the retractable gun turret, which is entered from the gunner's compartment, and lowered by him. When in the "down" position the turret can be rotated through a considerable range.

In the front of the gunner's cockpit is a large compartment used for stowing all manner of gear, but with ample gangway space. The floor is corrugated aluminium, but wooden strips are let into the corrugations, so that one actually walks on the wooden strips, which is very much more pleasant than walking on metal.

Situated immediately ahead of the plane of the front spars is the navigation and wireless compartment, with revolving seat and folding table on the port side. Ahead of the table, and also on the port side, are shelves carried on tubular stanchions. These shelves carry the wireless equipment, the battery of which is placed on the floor, under the wireless set.

The wireless compartment is separated from the pilots' cockpit by a half bulkhead on the port side. On the inner edge of this bulkhead is the very large tail-trimming wheel. On the starboard side is the seat for the second pilot. This folds flat against the wall, so that a free passageway to the nose is provided. The seat itself folds down and the backrest hinges back. On the port side, just ahead of the bulkhead, is the seat for the first pilot. This is divided into two halves, the half nearest the outer wall being fixed, while the inner half hinges down to enable the pilot to get into his seat between the back rest, the rim of the tail-trimming wheel, and the pillar rising from the floor, on which are mounted the engine controls. Once in his place, the pilot raises the inner half of the seat, which is provided with a catch. The control wheel is of

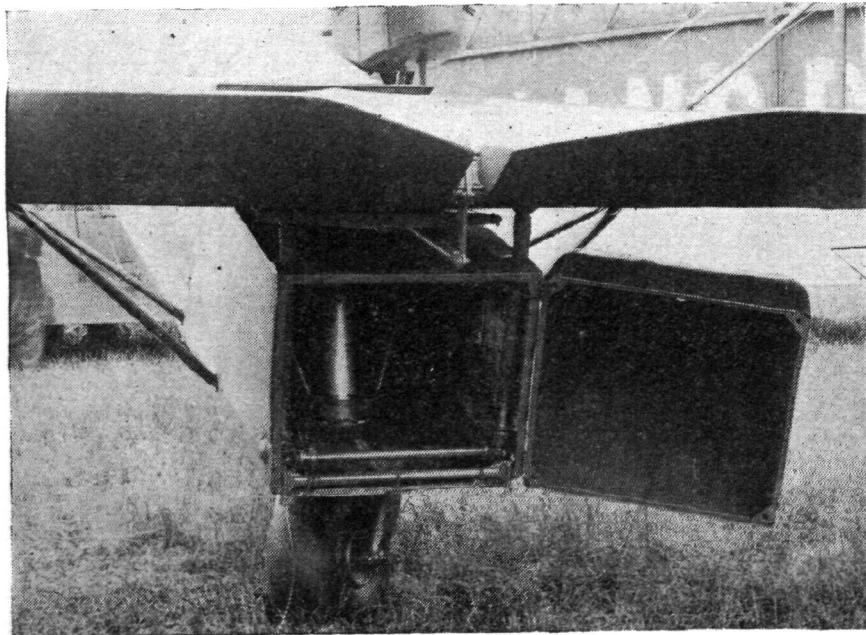


the cut-away type to give the pilot a good view of his instrument board, which in the "Heyford" is very neatly arranged. The second set of flying controls are built up as a complete unit, and can be detached in a moment when not required. Pedals with heel cups are provided for the rudder control, and are individually adjustable for length, the adjusting wheels being so placed that the adjustment can be made with the feet, and there is no need for the pilot to stoop down to reach them with his hands. A trigger on the control wheel applies the Palmer wheel brakes, and movement of the rudder pedals then gives the differential action.

A bulkhead with a two-fold door on the starboard side divides the pilots' compartment from the forward gunner's cockpit. This is provided with a "piano stool" type of seat which folds out of the way when not in use. Firing steps are provided at the sides of this compartment, so that the gunner can stand up on them and fire in a downward direction. In the extreme nose of the fuselage is a large window, hinged along its upper edge. A worm gear is provided for opening this window, which affords space for the bomb sight. On the starboard side is the switchboard by means of which the bombs are released, either singly or in salvos. The bomb release on the "Heyford" is electrically operated. On the rear wall of this compartment are the pegs for ammunition drums, etc., and other equipment.

The extreme stern of the fuselage is closed by a hinged cover, which opens to give access to the supports for the casting tail wheel, the tail-trimming gear, etc.

The first of the "Heyfords," which was rushed through the shops in order to have it flying at the S.B.A.C. Display at Hendon recently, is now at Radlett Aerodrome having service equipment installed. When this work has been finished the machine will be sent to Martlesham Heath for official performance tests. In the meantime no performance figures can be published. Other machines are in course of construction at the Cricklewood works, and some of these are expected to be flying towards the end of next month.



THE HINGED STERN CAP : This gives access to the tailwheel support, tailplane trimming gear, etc. Since this photograph was taken mass balances have been fitted to the elevators, and are housed inside the fuselage. (FLIGHT Photo.)

AIR TRANSPORT

REPORT ON CIVIL AVIATION

WE give below a *résumé* of the *Report on the Progress of Civil Aviation, 1932*, which has just been issued by the Air Ministry. Copies may be obtained from H.M. Stationery Office, Kingsway, W.C.2 (price 5s. net).

CIVIL FLYING

Imperial Airways continued to operate daily services between London and the Continent and weekly service between England and India. The weekly service between England and Central Africa was extended to Capetown. The route down the Persian Gulf was diverted from the Persian to the Arabian coast.

As part of the scheme proposed by the Canadian Government for accelerating mails, Imperial Airways made test flights between Croydon and Cherbourg in connection with the sailings of the *Empress of Britain*.

Feeder services by independent companies were instituted between Nairobi and Dar-es-Salaam, Kisumu and Entebbe, and Broken Hill and Elizabethville. The extension from Karachi to Delhi was operated by the Delhi Aero Club. The Tata Air Line, Karachi-Bombay-Madras, was opened in October.

The total mileage on subsidised flights on regular European services was 656,520. On the India and Africa services 1,077,000 miles were flown.

Air Survey and Photography

Experiments were made with the use of infra-red plates, which are expected to prove of great use in oblique photography.

Aerofilms, Ltd., received 50 per cent. more orders than in the previous year, the greatest advance being in work for industrial purposes.

The Air Survey Co., Ltd., with its subsidiary, the Indian Air Survey & Transport, Ltd., operated in Central Africa and mapped 19,300 square miles in the upper reaches of the Nile. The Indian company mapped a number of towns and districts in Bengal, the United Provinces, and the Punjab.

The Aircraft Operating Co., Ltd., completed its mapping of 1,000 square miles in Iraq. Its subsidiary African company completed the survey of Durban and did work for mineral prospectors.

Miscellaneous Services

Various work, such as private hire, etc., was carried out by several firms. British Air Navigation, Ltd., ran an experimental service between Bristol and Cardiff for one week. British Amphibious Air Lines, Ltd., operated a service between Blackpool and the Isle of Man. British Flying Boats, Ltd., ran a service between the Clyde and Belfast for one week. Sir Alan Cobham toured the country with National Aviation Day, Ltd. Norman Edgar started a service between Cardiff and Bristol, and Portsmouth, Southsea, and Isle of Wight Aviation, Ltd., a service between Portsmouth and the Isle of Wight. The Scottish Motor Traction Co., Ltd., commenced operations in Scotland.

Light Aeroplane Clubs

A new Air Ministry scheme of subsidising flying clubs was initiated. Fifteen clubs participated in this scheme. The total number of clubs at the end of 1932 was about 50.

Records and Long Flights

Capt. C. F. Uwins, on September 16, reached an altitude of 43,967 ft. in a Vickers "Vespa" with Bristol "Pegasus" engine. This was accepted as a world's record.

Mr. J. Mollison flew from England to the Cape in a "Puss Moth" in 4 days 17 hr. 30 min. Mrs. Mollison flew from the Cape to England in a "Puss Moth" in 7 days 7 hr. 5 min. Mr. C. W. Scott flew from Lympne to Australia in a "Gipsy Moth" in 8 days 20 hr. 47 min. Mr. Mollison flew from Ireland to New Brunswick in a "Puss Moth" in 30 hr. 15 min.

AIRCRAFT DEVELOPMENTS

New Types

The following new types of aircraft were granted certificates of airworthiness:—Airspeed "Ferry" (three "Gypsies"), A.W. "Atalanta" (four "Servals"), D.H.

"Fox Moth" ("Gipsy Major"), D.H. "Dragon" (two "Gipsy Majors"), General Aircraft "Monospar" (two "Pobjoys"), Miles "Satyr" ("Pobjoy"), Spartan "Cruiser" (three "Gipsy III's"), Percival "Gull" (Napier "Javelin").

The first "direct-control" "Autogiro," C.30, was produced.

Engines

Among the new engines produced during the year were: A.S. "Double Mongoose," Mark III (now called "Serval"), A.S. "Tiger," Bristol "Pegasus," types I-M.2 and I-M.3, Cirrus-Hermes "Hermes 4," D.H. "Gipsy Major," Napier "E.97" air-cooled (now called "Javelin"), Wolseley "A.R.9," R.R. compression-ignition "Condor."

Research

A vertical wind tunnel was erected at Farnborough to examine the problems of spinning. By the information thus obtained it is hoped to eliminate spinning tendency in the next few years.

Research has been proceeding on the problem of reducing noise in aircraft. Padding walls has been efficient, but weighs about $\frac{3}{4}$ lb. to 1 lb. per sq. ft. Gearing engines also reduces noise. Rolls-Royce, Ltd., have produced a silencer which adds no more to the weight of the machine than does the padding of the walls, and, moreover, reduces the noise heard on the ground. It is admitted that the completely silent aeroplane is not yet in sight.

GROUND ORGANISATION

Problems are arising in connection with aerodrome surfaces. It was believed that the quality of British turf, plus the use of tail wheels and brakes, would render special runways unnecessary in this country. It has been found, however, that when a large number of heavy aeroplanes are in use, the turf will not withstand the wear and tear. Special hard runways have been put down on African aerodromes, and experiments to find the best composition were in progress.

Wireless

At the close of the year Imperial Airways were carrying out tests with fixed aerials with a view to dispensing with trailing aerials for two-way communication.

The use of radio-telegraphy, as compared with radio-telephony, showed a further increase during the year, to the benefit of communication on the airways.

Lighting

During the year progress was made with the international standardisation of the principles of lighting aerodromes and airways. Experiments were carried out with the Chance-Airwork "shadow-bar" device to assist pilots in landing at night.

High-Tension Cables

To remove the danger to aircraft from the growing number of high-tension cables in the country, consideration was given to the possibility of lighting the cables at specially dangerous spots. Three methods were considered: (1) Neon tubes attached to the cables themselves, (2) indirect lighting from a projector lamp about 25 ft. away from the base of the cable, and (3) direct lighting by means of lamps on lattice masts of the same height as the pylons. The first method was rejected as unsatisfactory, the second was under consideration at the end of the year, and the third was found to be very expensive.

The Disarmament Conference

A Sub-Committee was appointed at Geneva to study the possibilities of internationalising civil aircraft, or preventing its misuse for military purposes. The conclusions of the first phase of the Disarmament Conference made reference to the subject in the following terms:—"Civil aircraft shall be submitted to regulation and full publicity. Further, civil aircraft not conforming to the specified limitations shall be subjected to an international régime (except for certain regions where such a régime is not suitable) such as to prevent effectively the misuse of such civil aircraft."

Licences and Certificates

At the end of the year 2,397 "A" licences for pilots and 369 "B" licences were current. There were also 86 licences for navigators, 1,221 for ground engineers, 397 for aerodromes, 981 certificates of registration for aeroplanes and 1,015 certificates of airworthiness.

Accidents

Sixty-eight accidents to U.K. aircraft requiring notification occurred in this country during the year, of which 12 caused loss of life and six caused severe injuries, one being a third-party injury. None of these accidents occurred on subsidised air transport. The Inspector of Accidents found that 41 out of the total of 68 were due to errors in airmanship. There were two cases of structural failure in the air, both fatal, and three accidents (one fatal) were due to extremely bad weather.

Air Mail Traffic

Details of the letter air mail traffic are:—

	lb.
Indian service	60,000
African service	15,900
Other Imperial services	14,300
Foreign extra-European services	10,100
Continental services	42,700
	143,000

British Empire

The following figures show the miles of routes in regular operation:—

United Kingdom	11,263
Canada	4,926
Australia	7,099
South Africa	2,814
India	2,010
Kenya	670
	28,782

Light Aeroplane Clubs

Canada	26
Australia	25
New Zealand	25
South Africa	4
Irish Free State	1
India	9
Kenya	1
Federated Malay States	1
Hong Kong	1
Straits Settlements	1
United Kingdom	50
	144

Southern Railway's Enterprise

By its collaboration with Imperial Airways, the Southern Railway has already shown its keen appreciation of the future of air transport. Further evidence of this appreciation is provided by the news that they are entering into an agreement with Airwork, Ltd., whereby the latter firm will, within the next six months, undertake a survey of that part of England covered by the company's services. This survey is to be carried out in order that a report may be rendered to the company from which they will be able to judge whether it is in their interests to establish aerodromes, adjacent to their lines or on land owned by them, whether there are any ports served by them which should be developed as seaplane bases, whether there are points between which air services might profitably be run; in fact the report will enable them to look at their whole property from an air transport point of view.

Ceylon Air Mail

In connection with the proposed air mail service connecting Madras with Colombo, the Ceylon Government, it is understood, have asked the Tata Company what value of mail they desire to be guaranteed. On receipt of their reply, the proposal to give the contract to Tata's for the conveyance of air mails from Colombo to Karachi will be placed before the Executive Committee of the Ministry of Communication for final settlement. Tata's originally proposed that their service should be a monopoly and a cheaper service, whereby it should not be necessary to send air mail by rail to Karachi. The Ceylon Government, however, will not agree to the condition. Apart from the question of guarantee, it is understood that little else requires settlement.

By Air to the I.O.M.

SINCE the end of March, that is in very little over three months, 177 aeroplanes have landed on the Castle-town aerodrome in the Isle of Man. Figures like this show that there is very definitely an opening for aerial traffic on routes which take a considerable number of hours by the normal means of surface transport or which lead over short stretches of water. Already Blackpool & West Coast Air Services, Ltd., are running a "Dragon" (two "Gipsy Majors") across to the island twice daily, and Midland & Scottish Air Ferries may probably be doing likewise in the near future.

New Machines for K.L.M.

THE Royal Dutch Air Lines (K.L.M.) have ordered some new machines—two Fokker F. XXII, four-engined monoplanes, fitted with 500-h.p. "Wasp" engines, and three Koolhoven FK43 three-seaters. The former, which have their engines mounted directly in the wing, will have seats for 21 passengers when used on European services, and couches for 10 passengers when used on Indian routes. They possess a top speed of 162.5 m.p.h., the average cruising speed being 136.7 m.p.h.; the first of these will be used on the Amsterdam-Copenhagen-Malmoe line, it is

hoped, early in 1934, and a second on the Amsterdam-Batavia connection. The three-seater machines will be used for the training of pilots.

Speeding Up in America

SEVERAL American airlines are speeding up their services between various towns. East Air Transport have announced a new high-speed schedule between New York and Washington. Using new twin-engined Curtiss "Condor" 15-passenger machines, they will fly ten trips daily, the time being 1 hr. 35 min. compared with the earlier time of 2 hr. 10 min. Three return trips daily will also be flown between Philadelphia and Atlantic City. Transcontinental and Western Air, in their service between New York and Los Angeles, are eliminating the former over night stop in Kansas City. United Airlines have increased the frequency of their services between New York and Chicago to eleven return trips daily. They are using twin-engined Boeing 10-passenger machines, the total time with stops for the 736 miles being 5 hr. 30 min. for the westbound trip and 4 hr. 25 min. for the eastbound. Thirty-eight "Wasp"-powered Boeing 247 machines have been delivered to United Air Lines to date.

French Unsubsidised Service

THE Compagnie Aérienne Française ("CAF"), an unsubsidised French concern who have had activities in Canada, are operating from July 10 a daily (Sundays excepted) service between Vichy, Lyons and Geneva, the route being covered in 1 hr. 30 min. The Ste Aerotrafic had before considered a Geneva-Vichy connection, but the French Air Ministry refused them permission to land at Vichy, as the airport was restricted to aeroplanes weighing under 2,646.4 lb. So apparently the French Air Ministry have changed their minds.

Deutsche Luft Hansa Co.

THE Deutsche Luft Hansa Co. will be henceforth called the "Deutsche Lufthansa Aktiengesellschaft" (now isn't that neat—after all, Deutsche Luft Hansa was a bit of a mouthful!). Messrs. Karl August von Gablenz and Walter Luz, who were managers, have been appointed members of the Board of Directors.

Portsmouth and Isle of Wight Services

THE following numbers of passengers were carried during the week ending July 13 on the services operated by the Portsmouth, Southsea, and Isle of Wight Aviation, Ltd.:—Spithead Air Ferry, Ryde and Portsmouth (201); Shoreham Air Ferry, Shoreham and Isle of Wight (5); Shanklin Air Ferry, Portsmouth and Shanklin (13); Shanklin Air Ferry, Ryde and Shanklin (9).

The First Air Mail from Calcutta

WE have received a letter, from Mr. G. E. Woods Humphrey, carried by the first regular air mail from Calcutta, which reached Croydon, per Imperial Airways air-liner *Heracles*, on July 17. This letter was one of some 50,000, over half a ton, carried by the air-liner.



The Countess of Willingdon, wife of the Viceroy of India, disembarking at Croydon from the Imperial Airways Atalanta type four-engined monoplane at the conclusion of her flight from India.

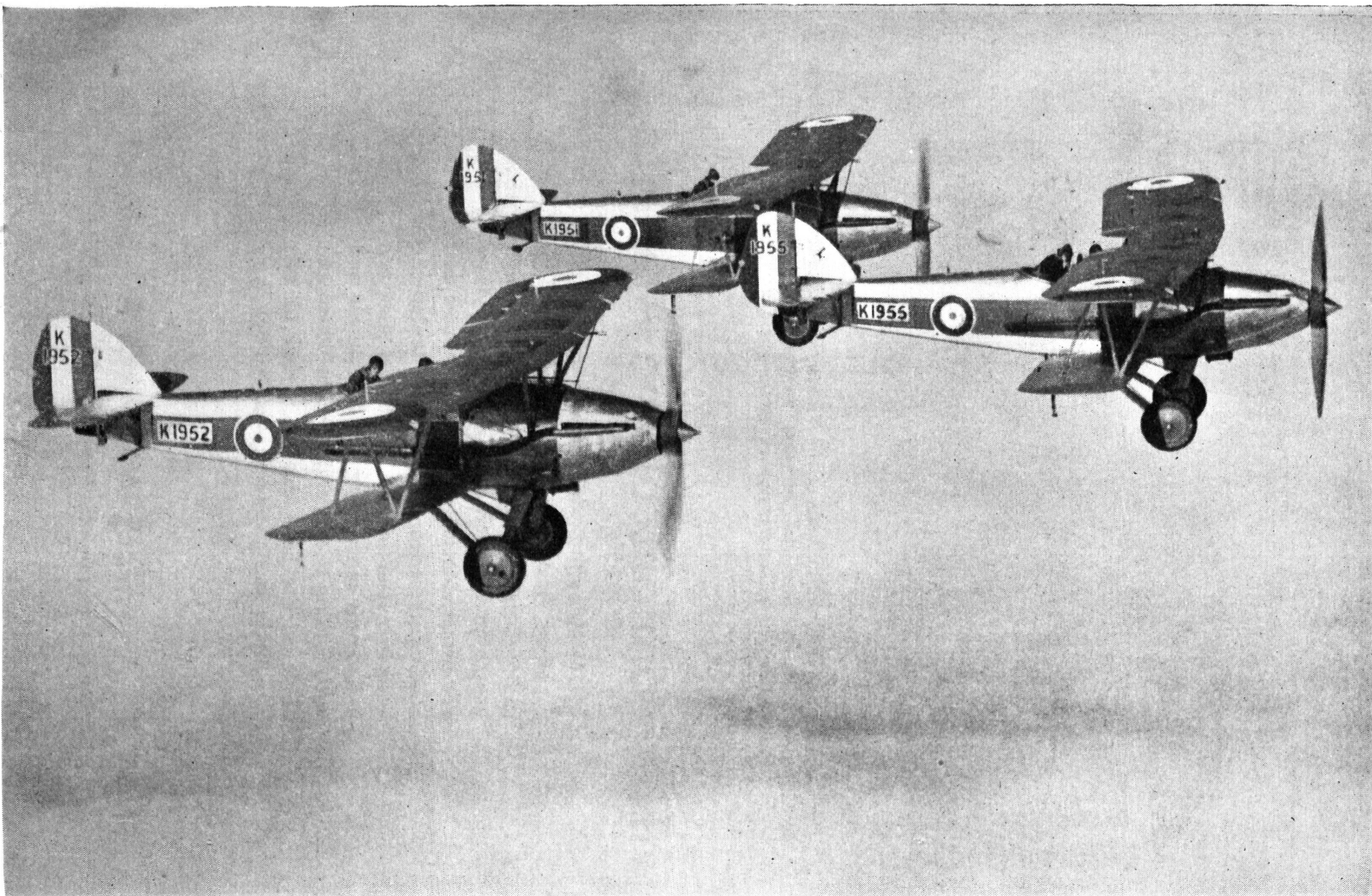
The comfort of the Atalanta

FLYING by Imperial Airways in the cabin of the Atalanta is as silent as travelling in a Pullman carriage. Owing to the high wing type of construction magnificent views are obtainable from Triplex windows and waiting passengers can shelter under the wing from sun or rain. Each passenger has a separate control for hot or cold air and with folding tables and seats in which the angle of the back can be varied to suit individual requirements, can enjoy every luxury.

Sir W. G. Armstrong Whitworth Aircraft Ltd.

Works & Aerodrome : Whitley, near Coventry

BP297



OUR ONLY TWO-SEATER FIGHTER SQUADRON: One flight of No. 23 (Fighter) Squadron in Hawker "Demos" (Rolls-Royce "Kestrel").
(*"Flight"* Photo.)

Advt.

THE ROYAL AIR FORCE STAFF COLLEGE

By MAJOR F. A. de V. ROBERTSON, V.D.

ONE of the most interesting institutions in the country is the Royal Air Force Staff College at Andover. The R.A.F. is the youngest fighting Service in the world, with the exceptions of the Air Forces of Italy, Australia, Canada, and India. The very conception of a separate Air Service is new. It was based originally on the somewhat rudimentary idea of supplying both Navy and Army with aircraft and pilots from one common source. The reason for making such a pool was mainly to avoid wasteful competition between the two Services in placing orders for aircraft with the manufacturers. On the face of it, the expedient of creating a new Service and a new Ministry to overcome such a difficulty seems like erecting an Earl's Court wheel on which to break a butterfly. However, in the stress of war the difficulty was a very real one, and it was preventing Great Britain from making the best possible showing in the air, and it was, in fact, overcome by the foundation of a new Service. There followed a common system of training and a pooling of personnel, both of which proved advantageous.

When the war was over, men had time to collect their thoughts and look round, and look ahead. Other aspects of an Air Force appeared; other possibilities of using it came to the imagination. An Air Force ceased to mean merely a source of supply of air arms for the Navy and the Army. It appeared as a totally new weapon of uncalculated possibilities. What could it do? What were the limits of its power? Where were the bounds between its activities and the activities of the Navy and the Army? No one could answer that question at once, and even now, 15 years after the inauguration of the Force, a precise answer would not be easy to find. There are still ex-

tremists on the one hand who think that air power can accomplish everything and that the older Services can be dismissed as obsolete—"Sink the lot! Sack the lot!" On the other hand, there are the extremists who can see nothing in air power but the provision of air arms for the Navy and the Army and who hold, not without reason, that such provision could be made quite adequately without maintaining a separate Ministry and a separate Service. Reasonable, thoughtful men hold that the truth lies somewhere between the two extremes, which is usually the favourite home of the blind goddess. Therefore, the new Force required a Thinking Department.

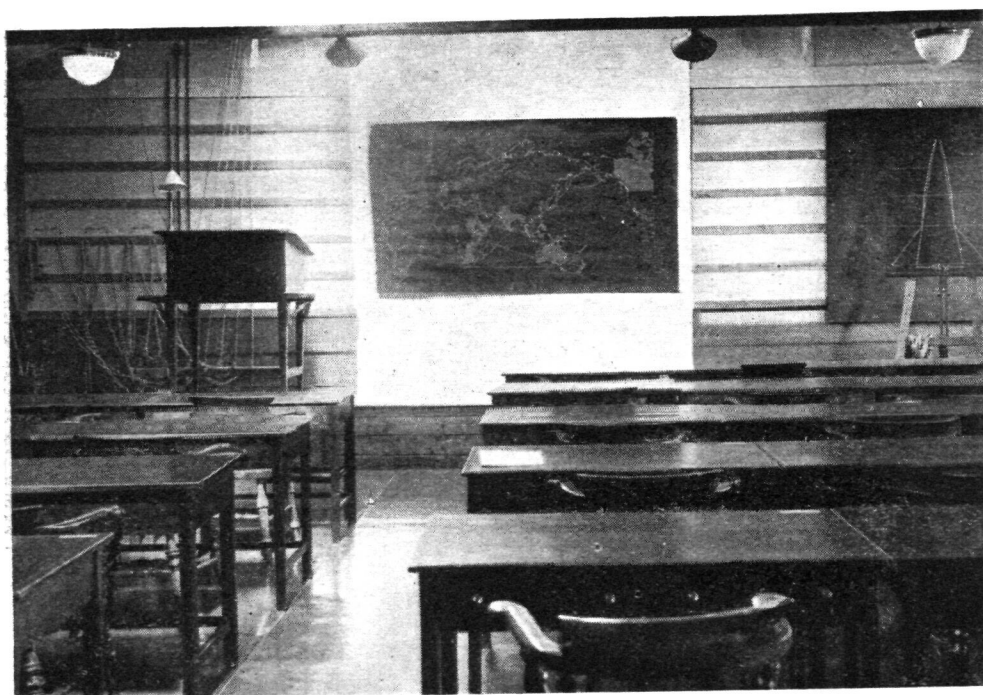
The episode of the Independent Air Force in the last year of the war had suggested certain possibilities. A year or two later the rapid suppression of the Mad Mullah of Somaliland suggested more. Mr. Winston Churchill gave concrete form to some of the speculations by handing over the defence of Iraq to the Royal Air Force. At later dates there have been developments on still other lines by the evacuation of the foreigners from Kabul and by the tours of flying-boat squadrons across the Empire. So full of possibilities was the new Force that it became necessary



THE HAWK: The badge of the R.A.F. Staff College is a copy of an image of the Egyptian god Horus. (FLIGHT Photo.)



HOMELY DIGNITY: The buildings in which the R.A.F. Staff College is still housed do not contrast well with the stately home of the Army Staff College at Camberley. (FLIGHT Photo.)



A LECTURE ROOM: In this lecture room students read papers on subjects of which they have made a special study, and a discussion follows. (FLIGHT Photo.)

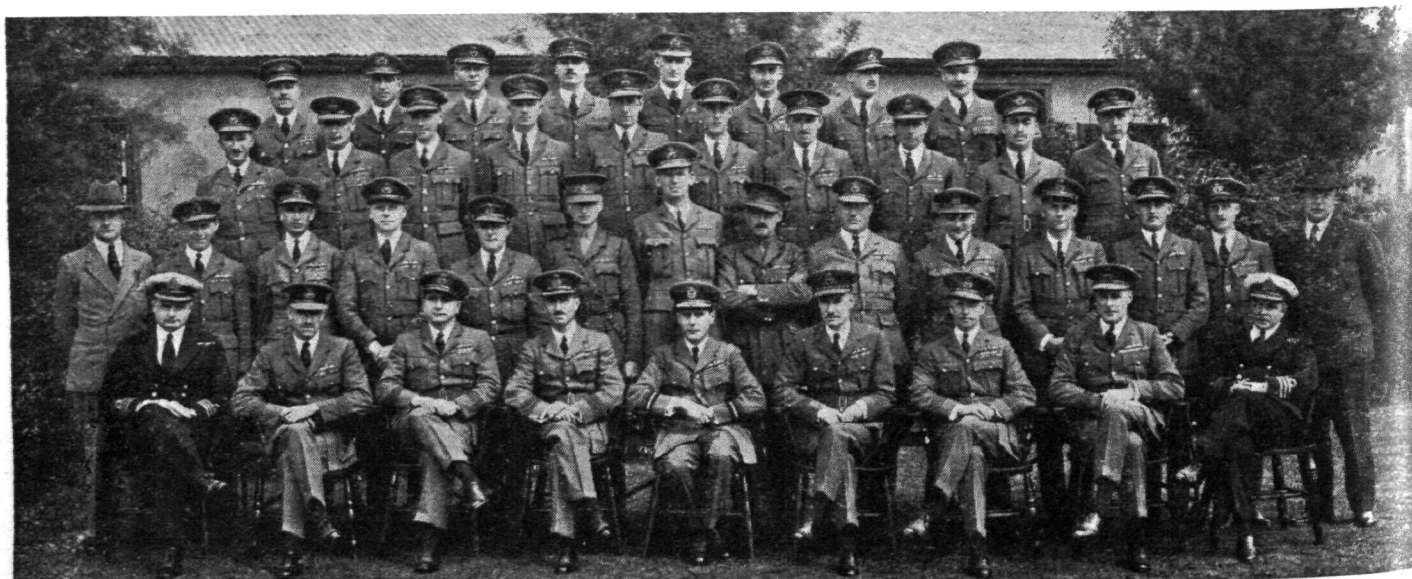
to collect ideas, to formulate them, to encourage a school or schools of thought, to produce a Royal Air Force doctrine. It is for the Air Council to draw up this doctrine and to modify it as may become necessary, but to transmit the ideas to officers of the Force, a Staff College is necessary.

The Army has had a Staff College at Camberley for many years, and when Lord Kitchener was Commander-in-Chief in India in the early years of the century, he founded one at Quetta. The Royal Navy had not thought a Staff College to be necessary until after the war, but as a result of the lessons of the war the Admiralty founded one at Greenwich. The Air Ministry wasted no time, and in 1922 the Royal Air Force Staff College was opened at Andover. Generally speaking, it follows the lines of Camberley, but with the considerable difference that the course at Camberley takes two years; that at Andover (and also at Greenwich) only lasts for one year. Like all R.A.F. innovations, the Staff College was started on economical, almost make-shift, lines. Camberley boasts a dignified and imposing building. The R.A.F. Staff College was accommodated in existing war-time huts erected by German prisoners, which happened to be available at Andover. In 1925 a decision was made that those buildings must suffice for another 10 years. Air Vice-Marshal Sir Robert Brooke-Popham was chosen as the first Commandant of the Col-

lege, and the opening ceremony was performed by Sir John Salmond, representing the Chief of the Air Staff. The second Commandant was Sir Edgar (as he now is) Ludlow-Hewitt, and in September, 1930, the present Commandant, Air Vice-Marshal P. B. Joubert de la Ferté, C.M.G., D.S.O., took over.

Andover is a large station. In addition to the Staff College, it accommodates the headquarters of the Wessex Bombing Area, Nos. 12 and 101 (Bomber) Squadrons, and a Station Flight. The last-named serves, among other purposes, to provide flying facilities for the permanent staff and the pupils at the College. A stranger to R.A.F. ways would expect to find such a station covered with imposing buildings, and would be highly astonished when he came in sight of the humble reality. Now, however, in a field on the opposite side of the road by which one approaches the station, two large red-brick buildings are arising. These are quarters for airmen, but they indicate that the days of the old war-time hut have nearly been fulfilled. In time, presumably two years from now, a permanent home for the Staff College must also arise in that same field. Let us hope that it will be worthy of the dignity of the body which is to occupy it.

The importance of the course at the Staff College may be realised if one keeps in mind that in no Service is it more necessary than it is in the Royal Air Force for officers in high command to have a clear grip of essentials and basic principles. A knowledge of aircraft is naturally necessary to all officers in the Force, but the mentality of the higher command must be very different from the mentality of the flying officer who is brilliant, maybe, at throwing a "Bulldog" about in the air. It would not really matter much if the commander of, say, a R.A.F. Group in the field were no longer a first-class pilot, provided that he was a good commander. To take the most elementary case, a platoon commander in the infantry may be a great success even though he is a duffer with his rifle, bayonet, and revolver.



THE DIRECTING STAFF AND STUDENTS: The Directing Staff are seated between the two Naval students. Names (left to right): Sqd. Ldr. A. L. Fiddament, D.F.C.; Wing Com. C. E. H. Medhurst, O.B.E., M.C.; Group Capt. A. A. Walser, M.C., D.F.C.; Air Vice-Marshal P. B. Joubert de la Ferté, C.M.G., D.S.O. (Commandant); Wing Com. N. H. Bottomley, A.F.C.; Wing Com. G. C. Pirie, M.C., D.F.C.; Wing Com. W. R. D. Acland, D.F.C., A.F.C. (Photo by Miss E. S. Howard, Andover.)

THE COMMON ROOM: All officers at Andover mess together, but the Staff College has its own common room. (FLIGHT Photo.)

While it is not necessary for young officers to be instructed in the higher art of war, it is still necessary that they should think on correct lines. For the higher ranks it is of the utmost importance that they should be able to think correctly and believe in a common doctrine. And the function of the Staff College is to teach this common doctrine of war.

The objects of the course at the Staff College are (a) to teach the pupils to teach themselves; (b) to impress on them the importance of staff duties; (c) to teach co-operation with the other two Services—not what is commonly meant by the work of Army co-operation squadrons, but the ways in which the Air Force as a whole can work with the Army and the Navy; (d) to inculcate the importance of finance in the Service; and (e) to give instruction in the higher direction of war.

It will be generally admitted that this is an impressive list of objects. How many of us would be better men in the world if at some time while still young, but mature, we had been trained to teach ourselves! At Cranwell efforts are made to lead the cadets along the path of self-instruction, and doubtless in many cases the results of those efforts are seen in the pupils at the Staff College. It can also be said that the best Honours Schools at the Universities, such as "Greats" (*Litterae Humaniores*) and the School of Modern History at Oxford, are calculated to teach men to help themselves towards knowledge and wisdom—and it must be remembered that Oxford and Cambridge send men into the commissioned ranks of the R.A.F. and presumably sometimes to Andover. Andover stands for higher education in Service matters, and no higher education can make much progress unless the pupils can, and will, teach themselves. Staff duties call for an analytical mind and a very "tidy" mind. It has been said that Fortune favours good organisation, and in war good organisation implies good staff officers. In the Army there have been critics who, rightly or wrongly, say that staff training produces a rather aloof type of mind, fonder of theories than of realities, and inclined to "red tape." Certainly, in the first year of the war, staff work was not always good, and it was sometimes believed that French staff officers were better than ours; but, however that may be, it is certain that a fighting force will achieve victory with a smaller casualty list if the staff work is good than if that work is indifferent. It would still be too soon to judge the quality of the Andover training by its results, but it inspires confidence to see the course laid down on common-sense lines. The importance of finance in the Service is a subject which rather surprises. The fighting services on the whole have the reputation of a tendency towards extravagance, holding to the theory that it is always cheaper to win a war than to lose one—which is very true. In the present days, when the Treasury turns the screw tight, the Service which is most skilful at making bricks with the minimum of straw is likely to remain the most efficient in its preparation for war.

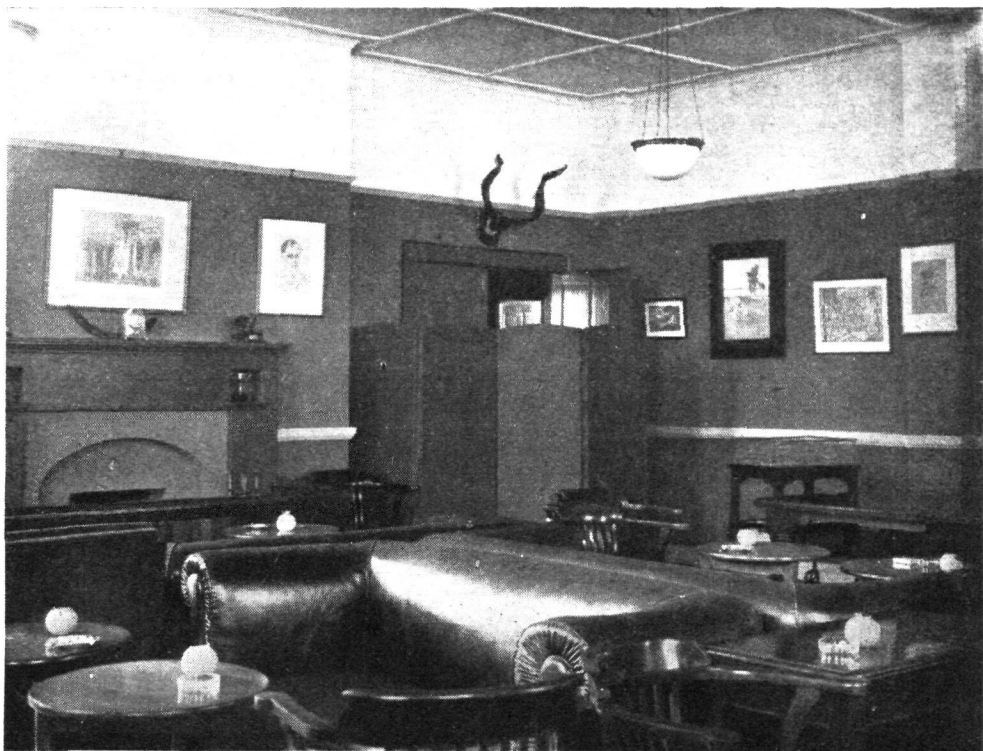
The higher direction of war is the most imposing subject which the Staff College has to teach. The College does not exist only to turn out efficient staff officers, but it is to the graduates of the College that the Service naturally looks for its future leaders. The higher direction of war calls for ability to plan sound strategy whether the force to be employed moves in the air, on the ground, or on the water. In small ways the Air Officer Commanding in Iraq is usually asked to approve the plans for operations by the Iraq Army. Some day an Air Officer may find himself in command of a combined body drawn from more than one Service, and his plan of campaign must be

based on true principles of strategy, combined with knowledge of the capabilities of both or all Services.

A point which has been much debated of late is the possible bombing of civilians by aircraft. Mr. Churchill, in a masterly speech recently, showed that such a practice would be waste of effort, and at the St. George's Day banquet Sir Robert Brooke-Popham, a late Commandant of the Air Staff College, and also of the Imperial Defence College, also poured ridicule on the idea that the Royal Air Force exists to slaughter women and children. The doctrine taught at Andover is the pure doctrine of the military objective. It is just possible that a Government, blind and deaf to all dictates of humanity and decency, may order a direct attack on civilians by aircraft. Such a policy does not come within the purview of the fighting services.

Each course starts at the beginning of a calendar year. The permanent staff consists of the Commandant and a directing staff of six. In each course there are 20 officer students of the General Duties branch of the R.A.F. and two of the Stores Branch, two officers from the Navy, one from the Home Army, one from the Indian Army, two from the Royal Australian Air Force, and two from the Royal Canadian Air Force. At the same time, R.A.F. officers are attending the Naval and Army Staff Colleges, and so a body of officers is being built up with intimate knowledge of the workings of Services other than their own. This excellent work is carried still further at the Imperial Defence College. Officers who have graduated at an Army Staff College have the initials *p.s.c.* after their names, and those who have passed through Andover have *p.s.a.* The three terms are very busy times, for there is much ground to be covered in a year. There are not too many lectures, but the students have many exercises and essays to compile. During the winter term debates are held in the library, largely to encourage the students to express themselves fluently in words, as they are also taught to express themselves on paper. During the summer term combined exercises with Greenwich and Camberley Staff Colleges are carried out. These exercises involve visits between the three Colleges and work both indoors and out of doors. Some of the Andover students go on attachment during the vacations to Army units and on board ships of the Royal Navy. During the summer vacation the Andover students are encouraged to travel abroad and study foreign countries. In normal times part of their expenses is allowed by the State, but during the present financial stringency this practice is in abeyance. Each course is divided up into groups, each group of some three officers taking up the study of one or two foreign countries. Obviously there is plenty to occupy the time of the students.

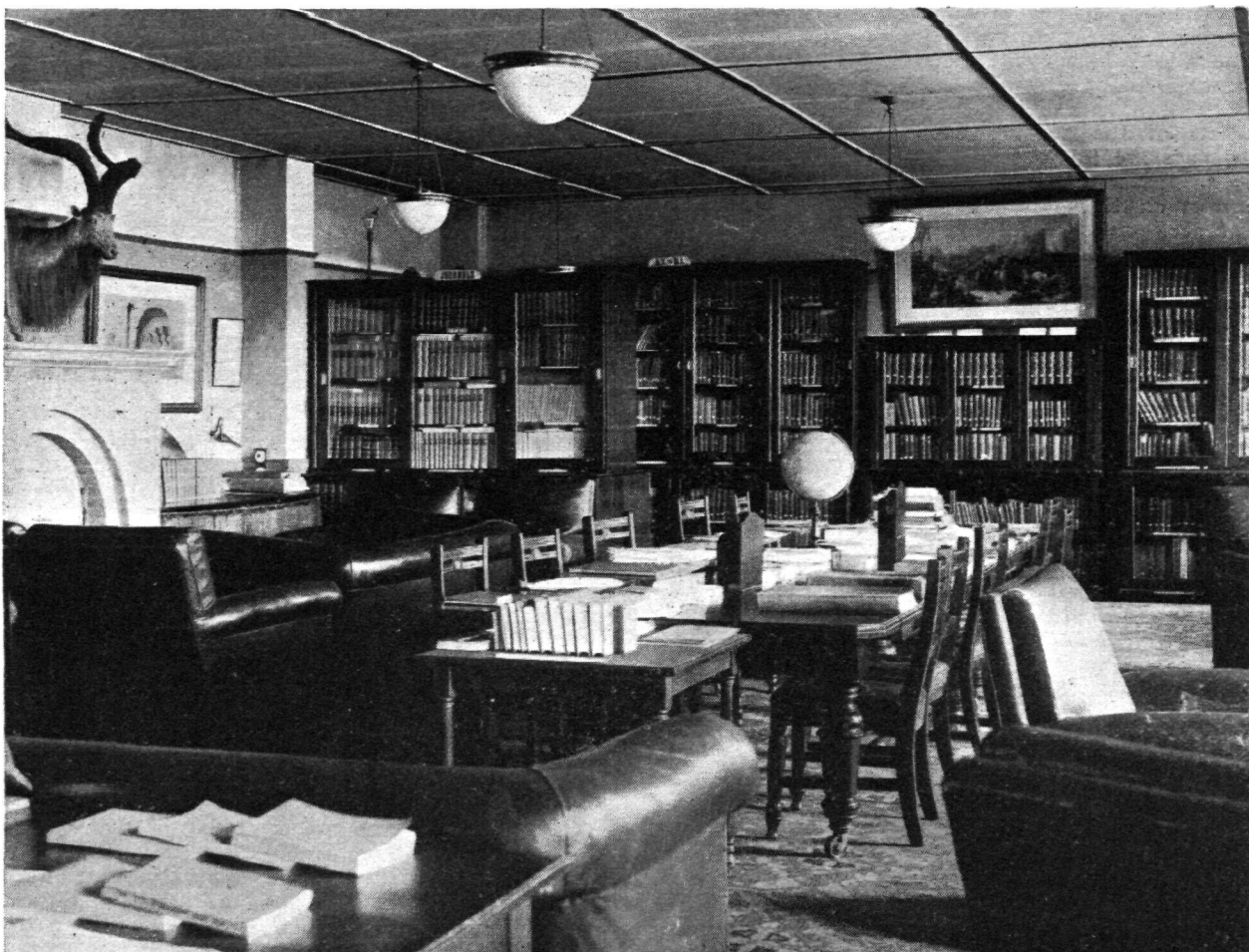
At Andover there is one common mess for all the officers. The Staff College men, however, have their own common



room and their own library. As the Commandant remarked, the library is a good library, because it is comfortable. It is with no feeling of hardship that a student betakes himself from the common room after dinner to the library, and spends the evening in study. It is a library which makes study really attractive and inviting. It may be taken for granted that the shelves are adequately filled. It is quite astonishing how cosy an Army hut can be made, and the R.A.F. are now quite experts at tackling this problem. As a further measure of economy at the Staff College it may be mentioned that the adjutant is a retired officer employed as a civilian, and the clerical staff are all civilians. The College has two married quarters in the station

and three houses in the town. Bachelor students live on the station. Incidentally, the majority of the students are of the rank of flight lieutenant, though a few are squadron leaders. The officers of the Navy now at the College are commanders, while the Army students are a captain and a brevet major.

The College journal is called "The Hawk," and was started in 1926. Its name is taken from the badge of the College, namely, a copy of the Egyptian god Horus. A silver hawk, carefully copied from an Egyptian design, is treasured in the common room as an embodiment of the spirit of winged wisdom which animates the R.A.F. Staff College.



THE LIBRARY : The Staff College Library is not only well stocked with useful books, but is also comfortable, and a pleasant place to spend an evening in study. (FLIGHT Photo.)

Royal Air Force Squadrons

Other descriptive articles concerning the work of various R.A.F. Squadrons, etc., have been published in FLIGHT as follow:—

H.M. Aircraft Carrier *Glorious*. May 16, 1930.
No. 4 (Army Co-operation), South Farnborough; No. 17 (Fighter), Upavon, and No. 33 (Bomber), Eastchurch. June 27, 1930.
No. 601 (County of London) (B.) Sq., A.A.F. (at Lympne). August 15, 1930.
No. 43 (Fighter) Sq. (Tangmere). September 19, 1930.
No. 2 (Army Co-operation) Sq. (Manston). December 19, 1930.
No. 101 (Bomber) Sq. (Andover). April 24, 1931.
Nos. 204 and 209 (Flying-Boat) Sq. (Mount Batten). June 12, 1931.
"1890-1912-1931." (An Outline of the Growth of the R.A.F.) June 26, 1931.
Cambridge University Air Sq. (at Old Sarum). July 10, 1931.
Central Flying School (Wittering). July 17, 1931.
Submarine Aircraft Carrier "M 2." July 31, 1931.
Oxford University Air Sq. (at Eastchurch). August 7, 1931.

No. 600 (City of London) (Bomber) Sq., A.A.F. (at Tangmere). August 21, 1931.
No. 605 (County of Warwick) (Bomber) Sq. (Cas. Bromwich). April 1, 1932.
No. 40 (Bomber) Sq. (Upper Heyford). May 13, 1932.
Nos. 7 and 58 (Bomber) Sq. (Worthy Down). June 10, 1932.
A visit to H.M.S. *Exeter* of 2nd Cruiser Squadron, Home Fleet. June 17, 1932.
Oxford University Air Sq. (Eastchurch). July 22, 1932.
Cambridge University Air Sq. (Netheravon). August 5, 1932.
No. 1 Air Defence Group (A.A.F. and Cadre Sqs.). August 12, 1932.
No. 100 (Bomber) Sq. (Donibristle). August 19, 1932.
Scotland's Auxiliaries; No. 602 (City of Glasgow) (Bomber) Sq. and No. 603 (City of Edinburgh) (Bomber) Sq. September 16, 1932.
London's Auxiliaries; Nos. 600, 601, and 604 B. Sq. October 20, 1932.
No. 25 (Fighter) Sq. (Hawkinge). December 8, 1932.
No. 19 (Fighter) Sq. Duxford. January 5, 1933.
Aircraft Carrier H.M.S. *Courageous*. January 12, 1933.
Lee-on-Solent. February 9, 1933.
No. 23 Fighter Squadron. March 2, 1933.
Gosport. The Fleet Air Arm Base. March 30, 1933.
Larkhill. R.A.F. Balloon Centre. June 8, 1933.

On the Films

READERS who think they know anything about handling flying boats ought to go to the Shaftesbury Avenue News Theatre, in London, this week, and see the Douglas Amphibians of the U.S. Marine being landed through heavy surf. A film worth seeing, when it is generally released, is "The Eagle and the Hawk." While it is true that we have had a surfeit of war flying films, it must be admitted

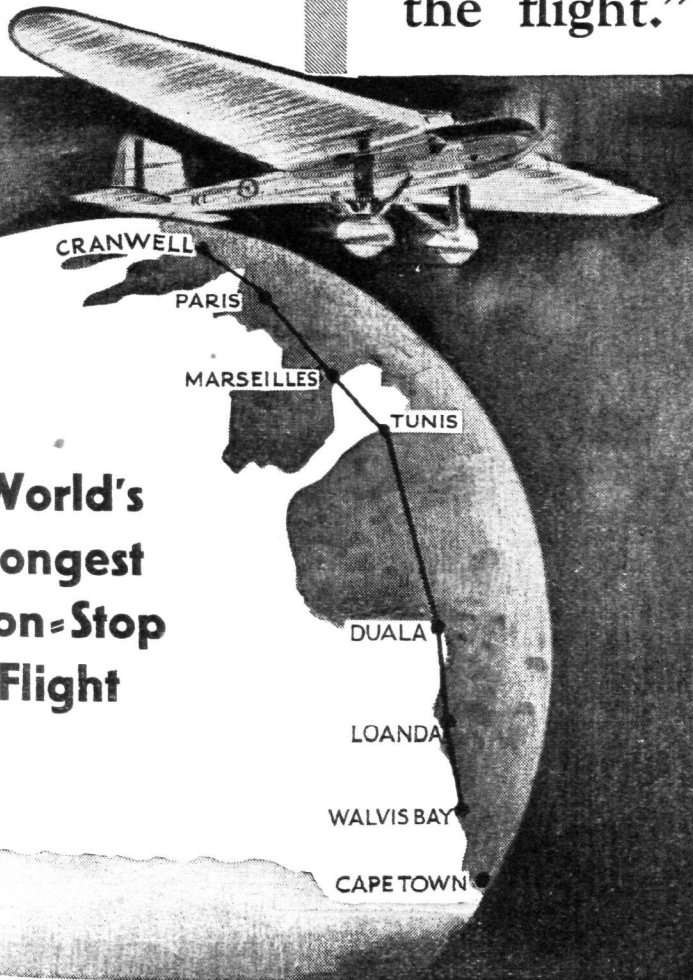
that this one is rather more palatable than most others have been. Fredric March, as the American pilot flying with the R.F.C. who finds the strain of having all his observers killed too much for him, is fine, and Cary Grant as a tough guy with his soft spot lends good support. Quite what Carole Lombard was brought in for is difficult to understand, for she certainly provides no love interest. Put briefly, the flying is good and the story not too sloppy.

ANOTHER WORLD'S RECORD

... "The engine ran faultlessly for the 57 hours 25 minutes we were in the air.

We did not experience one qualm on its account throughout the flight." ...

Squadron Leader O. R. GAYFORD
in a published cable to the Air Ministry



**World's
Longest
Non-Stop
Flight**

Starting from CRANWELL at 7.15 a.m. on 6th February, 1933, a FAIREY (NAPIER-ENGINE) AEROPLANE, piloted by Squadron-Leader O. R. Gayford, D.F.C., A.F.C., and Flight-Lieut. G. E. Nicholetts, A.F.C., flew non-stop to Walvis Bay in British South West Africa, a distance of 5,309 miles, in 57 hrs. 25 min.

NAPIER

ENGINES

D. NAPIER & SON, LTD.
ACTON, LONDON, W.3

Save time by using the Air Mail.



SINCE 1917 THE CRITERION BY WHICH ALL
TRAINING AEROPLANES ARE JUDGED

The famous "Air University" of Air Service Training Limited, the only school of its kind in the world, assures the high standard of its flying instruction by using Avro training aeroplanes equipped with Armstrong Siddeley seven-cylinder radial engines.



Dunlop Tyres and Wheels Standard

AIR SERVICE TRAINING LTD

A.V. ROE & CO., LTD, Newton Heath, MANCHESTER • CABLES: TRIPLANE MANCHESTER

Kindly mention "Flight" when corresponding with advertisers.

AIRISMS FROM THE FOUR WINDS

The Italian Formation Flight

As was reported in last week's issue of FLIGHT, the 24 Savoia Marchetti flying boats, comprising the Italian Squadron which is flying to Chicago, reached Reykjavik, Iceland, on Wednesday, July 5, where they were held up from further progress by unfavourable weather. On Tuesday, July 11, General Balbo decided to continue the flight, but his machine refused to leave the water owing to what later was found to be a clogged petrol filter. On the following day, the trouble to General Balbo's machine having been remedied, the Squadron left Iceland for Cartwright, Labrador, a distance of about 1,500 miles. The machines flew in eight groups of three, and at times were forced down to within a few hundred feet of the water by fog and the fear of excessive cold. After passing Greenland the weather cleared slightly, improving as the American coast was approached. Under 12 hr. after leaving Iceland the flight reached Cartwright, and all the machines alighted safely on the water. Early in the morning of Thursday, July 13, the machines left Cartwright, Labrador, for Shediac, New Brunswick, where they arrived about five hours later, and were greeted by thousands of people. According to reports the cruising speed of the machines over this stage was about 150 m.p.h. On the next day, Friday, July 14, the flight took off and flew to Montreal, 500 miles away. On landing here General Balbo was welcomed by representatives of the Canadian Government and large numbers of people who had come into the town from miles around. On Saturday, July 15, the Squadron took off from Montreal, and arrived at Chicago in the evening, alighting on the waters of Lake Michigan. The mileage of the flight up to date and including the next stage to New York is:—

		Distance.	
From	To	Kilometres.	Miles.
Orbetello	.. Amsterdam	.. 1,400	.. 875
Amsterdam*	.. Londonderry	.. 1,000	.. 625
Londonderry	.. Reykjavik	.. 1,500	.. 940
Reykjavik	.. Cartwright	.. 2,400	.. 1,500
Cartwright	.. Shediac	.. 1,200	.. 750
Shediac	.. Montreal	.. 800	.. 500
Montreal	.. Chicago	.. 1,400	.. 875
Chicago	.. New York	.. 1,600	.. 1,000
		11,300	7,065

The total distance of just over 6,000 miles to Chicago has been covered in about 47 flying hours over a period of 15 days. Messages of congratulations were sent to Gen. Balbo by His Holiness the Pope, and by Mussolini. Lord Londonderry also sent the following telegram:—

The Royal Air Force have watched your progress with great interest and admiration. Delighted to hear you have reached Chicago safely. A magnificent achievement upon which I heartily congratulate your Excellency and all under your command.

Wiley Post's Flight

MR. WILEY POST, who is attempting to beat his own record of 8 days 15 hr. 51 min. for a flight round the world, left New York on Sunday, July 16, and arrived in Berlin at 11.55 a.m. on Monday, July 17. He flew the 3,600 miles crossing of the Atlantic in 25 hr. 46 min., and incidentally has made the first non-stop flight from New York to Berlin. Mr. Post, after a stay of just under 3 hr., took off again for Novosibirsk, in Siberia, 2,800 miles away, but was forced down by weather at Koenigsberg. He proceeded on July 17, reaching Moscow in the afternoon. Three hours later he left for Novosibirsk. It appears that Mr. Post received considerable help during his flight from a wireless station in Great Britain, probably the North Regional broadcasting station south-east of Huddersfield. His machine was the rebuilt Lockheed "Vega" Winnie Mae, on

which he and Harold Gatty made a world flight two years ago.

Lithuanian Airmen Crash

CAPT. STEPHEN DARIUS and LT. GIRENAS, who were attempting to fly non-stop from New York to Kovno, the Lithuanian capital, have crashed and lost their lives. Flying a Bellanca monoplane, they succeeded in crossing the Atlantic, but were found dead amid the wreckage of their machine in a wood less than 400 miles from their objective.

The Finding of Mr. Mattern

DETAILS of the finding of Mr. Mattern are now available. It appears that 14 hr. after leaving Khabarovsk the engine of his monoplane began to overheat and he decided to land. Unfortunately the country beneath was bad, and the under-carriage, engine and fuselage were all damaged. Mr. Mattern was stranded in the most remote part of Soviet territory, and for eight days lived at the scene of the crash. Eventually, on the night of June 29, 15 days after leaving Khabarovsk, he was rescued by a party of Chukchi natives who were travelling down the Anadir river on barges.

Mr. Wood Forced Down

MR. JAMES WOOD, who is flying to England from Australia, made a forced landing near Hendaza, Burma. Later he took off again and returned to Rangoon.

Col. Lindbergh's Survey Flight

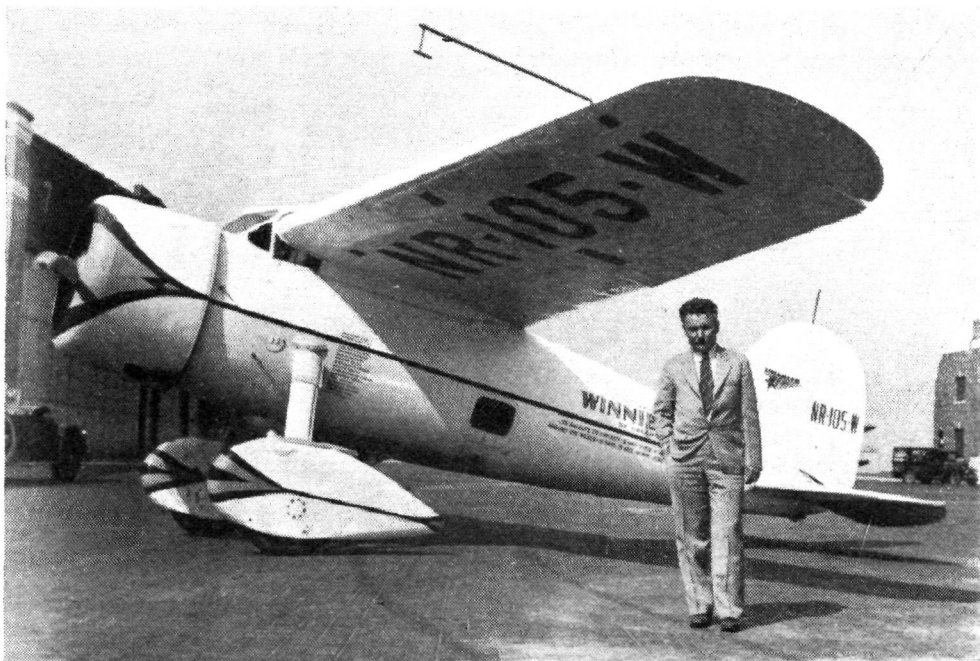
COL. AND MRS. LINDBERGH left Halifax for Greenland by way of Newfoundland on Wednesday, July 12.

French Formation Flight

A FORMATION of 25 French machines are to make a tour of the French African possessions. The flight will leave Istres aerodrome, Marseilles, early in November, under Gen. Vuillemin, and will visit Rabat, Dakar, Niamey, Zinder, Touggourt, Tunis, Algiers, Oran, and Mekness.

The Williamson Camera on Tour

A STRIKING example of the growing use of aviation to the business man has been afforded by the tour of the Baltic States just completed by Mr. P. T. Griffith, the Sales Manager of the Williamson Manufacturing Co., Ltd. The company produced a new type of aircraft camera known as the Eagle IV, and the experimental model was exhibited at the Paris Aero Show in November last, as a result of which numerous inquiries were received. Arrangements were therefore made to demonstrate it personally to the various Governments interested. A "Puss Moth" aeroplane was chartered and complete camera with automatic electric operation was carried. The itinerary lay through the following countries—Belgium, Germany, Poland, Lithuania, Latvia, Esthonia, Finland, Sweden and Denmark—a total distance of some 3,500 miles. The whole



Wiley Post and his Lockheed "Vega" Winnie Mae.

journey was carried out to schedule in seventeen days, and demonstrations were successfully given in each town. It will thus be seen that the average daily distance travelled was some 200 miles, and there is little doubt but that had any other means of transport been employed the time taken would have been 3-4 months. The Williamson Manufacturing Co., Ltd., are to be congratulated on their enterprise, and it is gratifying to be able to say that already the business results have fully justified the venture.

A Mishap near Littlehampton

A FAIREY "Fox," owned by Mrs. Victor Bruce and flown by Flt. Lt. J. B. W. Pugh, A.F.C., caught fire near Littlehampton, Sussex, on July 14. Flt. Lt. Pugh landed the machine at Ford aerodrome, but received an injured ankle. His two women passengers were also slightly injured.

Stinson Freighter Machine

THE Stinson Aircraft Co. are producing a new cantilever low-winged monoplane, which will be able to carry three cars of the size of an "Auburn." The average speed of this machine will be about 85 m.p.h.; it will probably be multi-engined developing between 1,500 and 2,000 h.p.

G.A.P.A.N. Medical Adviser

THE Guild of Air Pilots and Air Navigators has appointed Dr. A. Penrhyn Bowdler as its honorary medical adviser. Dr. Penrhyn Bowdler has served for many years with the Central Medical Board, and is personally known to a great number of commercial pilots. The Court feel, in making the appointment, they have selected somebody who will be able to give them most able counsel and assistance on the difficult subject of medical standards of physical fitness, and one who has the interests of pilots entirely at heart.

New R.A.F. Caterpillars, etc.

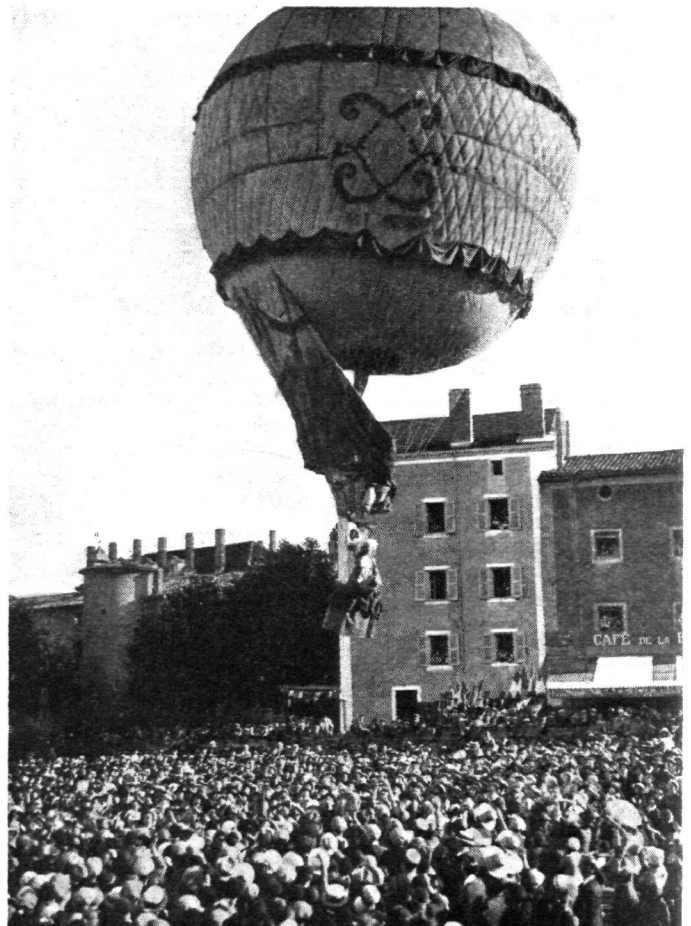
THE following Royal Air Force personnel have recently jumped for life with Irvin parachutes and qualified for membership of the Caterpillar Club:—Flt. Lt. J. Moir, F/O. A. C. Drew and L.A.C. M. G. Friese-Greene. Two new foreign members are Lt. H. von Schinkel, Swedish Air Force, and Sgt. Pilot Marcel Hanset, Belgian Air Force. The latter makes the seventh Belgian member and the former the eleventh Swedish member on record. Membership of this club is open to all nationalities and both sexes, and at present totals nearly 800.

Police Aircraft

SIR JOHN GILMOUR, the Home Secretary, stated in the House of Commons on Monday, July 17, that he had given permission to two county police authorities to incur small items of expenditure by experimenting with aircraft for official purposes.

Low Flying Over Churches

REPRESENTATIONS have been made to the Air Ministry concerning low flying over cathedrals, churches and other ancient buildings. The Air Ministry calls attention to pilots to the necessity of exercising care when flying over



FLYING—150 YEARS AGO: In 1783 the Brothers Montgolfier made pioneer history when they accomplished the first balloon ascent at Annonay, France, by means of hot air heated by straw burnt underneath the balloon. The 150th anniversary was celebrated, as shown above, at Annonay by a graphic reconstruction of the ascent, with "villagers" wearing costumes of the period.

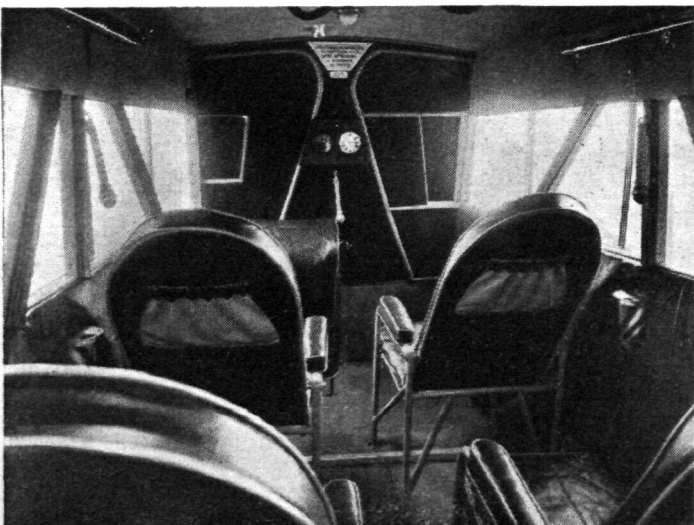
such buildings. Article 9 of the Air Navigation Order, 1923, covers this, of course.

High Speed from Milan to Rome

A YOUNG engineer, Signor Monti, flew from Milan to Rome in a new monoplane averaging 210 m.p.h.

Honour for A. V.-M. Longcroft

AIR VICE-MARSHAL CHARLES LONGCROFT had the honour of being received by His Majesty the King, who handed to him the Insignia of Gentleman Usher of the Scarlet Rod of the Most Honourable Order of the Bath.



THE CABIN OF G-ACGG: Last week the newspapers made much of a "forced landing" made by the Prince of Wales' "Dragon" when H.R.H. was on his way to Weymouth to open the new harbour works on July 13. Actually, of course, Flt. Lt. Fielden, the Prince's pilot, merely made a precautionary landing near Swanage, as the weather was so bad that it was unwise to go on by air. (FLIGHT Photos.)

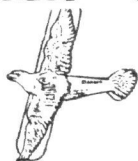


AIR ARMADA REACHES CHICAGO!

*Greatest Reliability Test in
History of Aviation accomplished on*

STANAVO

AVIATION



FUEL

SUPPLIED BY THE PROPRIETORS OF PRATTS

Again, as in the Schneider Trophy, the Lindbergh, Kingsford-Smith, and Earhart flights, Sir Malcolm Campbell's speed shattering record, the Isle of Man Tourist Trophy Races, and other epic achievements, the Experts came to the proprietors of Pratt's for their petrol requirements, knowing that absolute reliance may unfailingly be placed in the Company's products.

Motorists, too, have the fullest assurance that the same scrupulous care is devoted to the production of Pratt's Ethyl and Pratt's High Test as in the special fuels supplied to the world's leading experts on land, sea and in the air.

Save time by using the Air Mail.

THE DE HAVILLAND AIRCRAFT COMPANY ANNOUNCES TOP OVER GIPSY UNNEEDED AND THAT THE COMPLETE HAS BEEN 750 H.P.

EXPERIENCE

The de Havilland Aircraft Company Limited have been manufacturing GIPSY ENGINES for SEVEN YEARS, and have followed carefully the careers of over 3,000 of these engines which are in service all over the world.

GIPSY ENGINES have been fitted by more than THIRTY manufacturers into over FIFTY types of aircraft, both British and foreign.

GIPSY ENGINES have been used for passenger and mail-carrying, military and civil training, racing, record-breaking, long-distance non-stop flying, private aircraft—in fact for every duty upon which light aero-engines can be employed, not only in Europe but in almost every country in the World where flying is possible, and under every sort of climatic and operational condition.

GIPSY ENGINES of all types and in the most searching tests which have been made. GIPSY ENGINES have undergone many type-test conditions; they have, for power-to-weight ratios considerably higher than standard strengths; they have done many hours of work. And they have emerged from all these tests. In addition, the most stringent laboratory inspection and quality, accuracy and finish.

THE DE HAVILLAND AIRCRAFT COMPANY LIMITED,
STAG LANE AERODROME, EDGWARE, MIDDLESEX, ENGLAND.

Kindly mention "Flight" when corresponding with advertisers.

AFT COMPANY LIMITED

THAT

OVERHAULS

MAJOR

RE

CESSARY

OD BETWEEN

OVERHAULS

ENDED TO

OURS

NT

in particular have been submitted to continuous improvement. Gipsy engines on the test bench under extreme conditions for extended periods at compression have done long runs on very lean mixture at full throttle and full load.

on materials and parts, coupled with testing, ensures a high standard of

ACHIEVEMENT

GIPSY ENGINES have successfully accomplished FOUR trans-Atlantic flights (no other light aero-engine has flown across the Atlantic Ocean); they have established records to and from Australia and to and from the Cape; they have won the Race for the King's Cup twice in the last two years, and of the 41 GIPSY ENGINES entered in these two races, not one was eliminated through mechanical trouble. They have won the Zenith Cup (France) for the last four years and the Viceroy's Cup (India) for the last two.

These, among many other similar achievements, together with the Company's long experience and the results obtained from their experiments, satisfy them that the announcement made above is fully justified.

ASSOCIATED COMPANIES IN CANADA, AUSTRALIA, S. AFRICA AND INDIA.
LICENCEES, SELLING AND SERVICE AGENTS THROUGHOUT THE WORLD.

Save time by using the Air Mail.

KING'S CUP

1933

Again!



Again!

MAGNETOS

were fitted to the Aeroplanes gaining

1st Place

D. H. Leopard Moth—
Gipsy Major Engine

2nd Place

Comper Swift—
Pobjoy Engine

3rd Place

D. H. Leopard Moth—
Gipsy Major Engine

SIDDELEY CHALLENGE TROPHY

Comper Swift—
Pobjoy Engine

**BTH—THE MAGNETO OF
UNFAILING RELIABILITY**

BTH **COVENTRY**

THE BRITISH THOMSON-HOUSTON COMPANY LIMITED, COVENTRY, ENGLAND

Kindly mention "Flight" when corresponding with advertisers.

AIRPORT NEWS

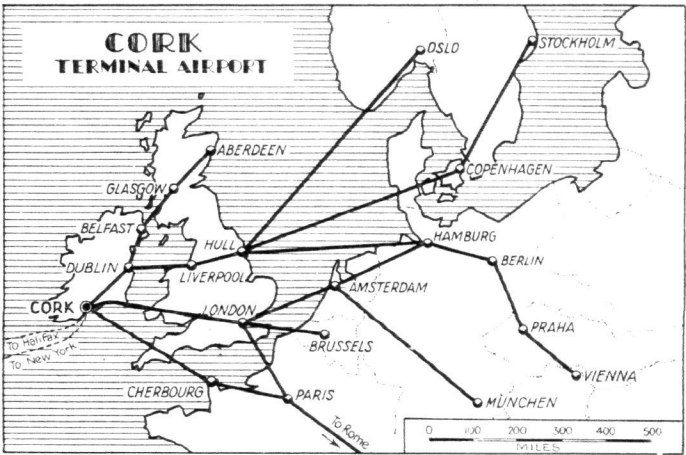
CORK AS A TERMINAL AIRPORT

WE have already made several references to the scheme for establishing an airport at Cork, and we have now received the draft report on the proposed scheme by Mr. Richard F. O'Connor, M.Inst.C.E.I., As.M.Inst.C.E., County Surveyor of County Cork, which we think contains much of interest. The report reads as follows:—

The unique geographical position of Cork Harbour as the most westerly harbour in Europe, situated on the track of the North Transatlantic steamship routes and equipped to accommodate large liner traffic makes it the obvious site for the North European terminal airport. Cork Harbour is already established as a port of call for transatlantic liners.

At a meeting of the Cork Harbour Board on March 1 last, the Chairman, Mr. Richard Wallace, clearly demonstrated the capacity of the harbour in the following statement:—"Cork Harbour has been a port of call for transatlantic liners since the early days of steamboats. It has been regularly used by such large liners as the *Columbus* (32,565 tons) and the *Georgic* (28,000 tons). Five transatlantic lines make Cork a regular port of call . . . The port was used last year by such giant liners as the *Ile de France* (43,000 tons), *Homeric* (34,351 tons), and *Columbus* (32,565 tons). The fact that the *Ile de France*, *Columbus* and *Britannic* were all at anchor in the Inner Harbour, at the same time on Sunday morning, August 14 last, is proof sufficient of accommodation afforded by Cork Harbour."

Sir Eric Geddes, Chairman of Imperial Airways, recently stated that within five years the crossing of the Atlantic by seaplane services will become an accomplished fact. Whether cross-Atlantic traffic is by means of seaplane or surface craft is immaterial as regards the distribution of this traffic over North Europe by aeroplane, as the aeroplane has advantages in this respect with which the seaplane cannot so far compete. (1) The larger proportion of paying load carried by aeroplane compared to seaplane, both being of the present normal weights, and (2) the small number of seaplane bases and emergency landing sites compared to the number of aeroplane landing grounds established or likely to be established in England and North Europe.



Aerial communications between Cork and the Continent.

It is, however, material that Cork Airport should be set up at once if advantage is to be taken of the present liner traffic, so that air routes will be established before the seaplane crossing of the Atlantic becomes practical business.

The following notes give some particulars of the proposed services and works:—

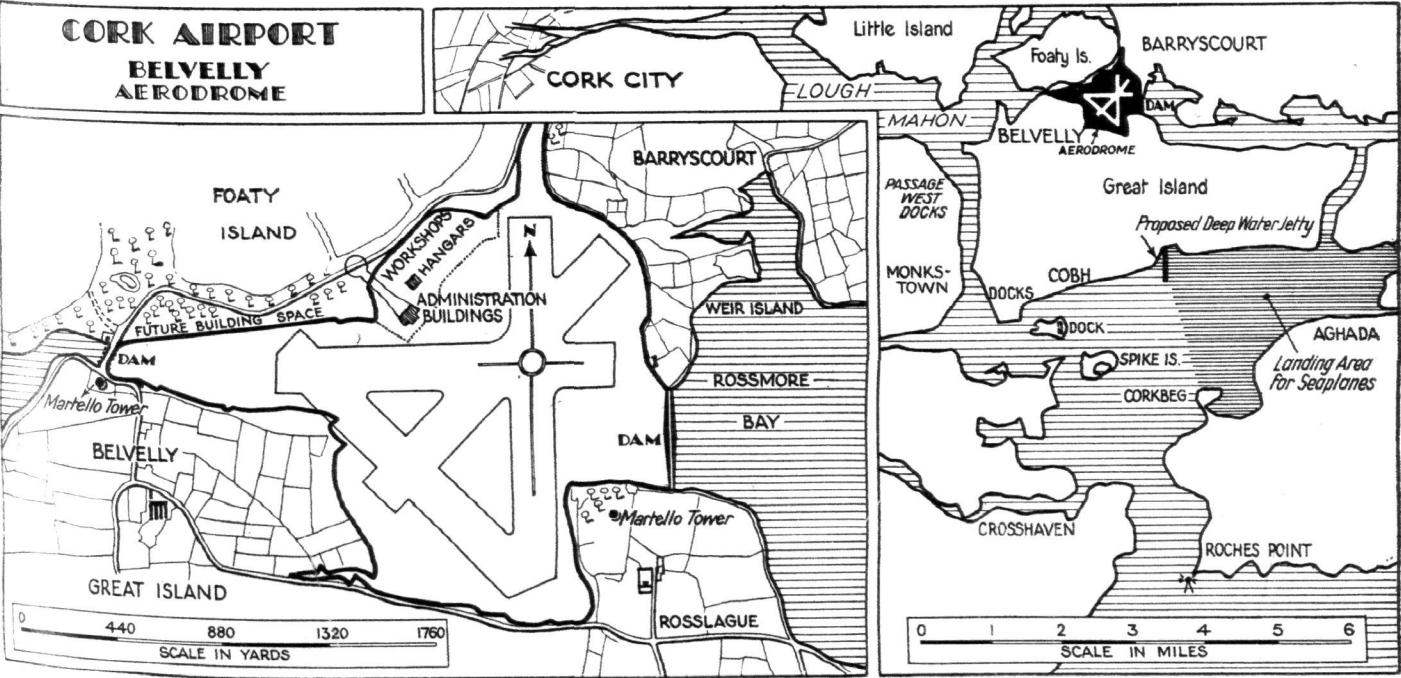
European Air Services

See accompanying map. The first object of this scheme is to gain control of English and Continental Transatlantic mail services. A proportion of passenger and light goods traffic will in the ordinary course follow the mail routes.

Projected airlines from Cork Airport are as follows:—

- (1) Cork-Dublin-Belfast-Glasgow, serving Scotland.
- (2) Cork-Dublin-Liverpool, serving the English Midlands, with aeroplane line to Hull, the projected seaplane base connecting with the Scandinavian countries.
- (3) Cork-Rosslare-Pembroke-London, connecting with existing airlines to the Continent, and serving the South of England.
- (4) Cork-Cherbourg (seaplane service), a direct service with France.

It is to be noted that the sea crossing from Ireland by these routes is 50 miles to Pembroke, 60 miles to Holy-



THE PROPOSED CORK AIRPORT : These sketch plans show the location of the land and sea airports and the lay-out of the aerodrome.

head and 22 miles to Scotland, which distances are well under the safe limit for multi-engined aeroplanes.

Flying times over these routes from Cork Airport based on a speed of 100 miles per hour are as follows:—Dublin, 1½ hr.; Belfast, 2½ hr.; Glasgow, 3½ hr.; Liverpool, 3¾ hr.; London, 4½ hr.; Brussels, 6½ hr.; Paris, 6¾ hr.; Amsterdam, 7½ hr.; Berlin, 10½ hr.

The saving in time over present schedules is so considerable that air services on these lines are bound to draw traffic. As an instance in time saving, the mails carried on the eastward-bound liners passing Cobh every Friday reach London too late for delivery during office hours on Saturday. By air service this mail would be delivered on Saturday morning. In order to achieve these services radiating from Cork the only initial expenditure necessary is the cost of constructing and equipping an aerodrome, and of equipping landing water for seaplanes. Both requirements can be met at comparatively small cost.

Belvelly Aerodrome

The most suitable site for the aerodrome is the tidal mud flat at Belvelly situated between Great Island, Little Island and the mainland (see plan, p. 729). It is practicable to reclaim an area of 460 acres of this ground by constructing dams from Weir Island to Rosslague and at Belvelly Bridge, and by constructing suitable tidal sluices. The mud level is at an average height of seven ft. over mean low water of spring tides, being approximately 1 ft. over mean tide level. The grading of the surface lends itself to the quick run off of surface water.

In the final development of this scheme there is room to construct runways measuring from ½ mile to 1½ miles length. For the present the length of these runways may be limited to say 500 lineal yards in any direction. The prevailing winds here are from the west and south-west.

The site proposed for the control buildings is on or in line with a promontory on Foaty Island, which will give full view of the whole landing ground. The hangar site is sheltered and well situated for access, with space for workshops and stores behind. There is unlimited room for

future extension of aerodrome buildings, the space available on Foaty Island alone being a mile long.

The Belvelly site has already been examined from land and air by several experienced airmen, including Col. C. Russell, Messrs. W. R. Elliott, C. Rac, W. Gairdener and Flt. Lt. Chris Clarkson. All agreed as to the great possibilities of the site as likely to form the safest landing ground in Europe.

Communications

The site of the aerodrome buildings is 5 miles by road from the Deepwater Quay at Cobh and 10 miles from the centre of Cork City. Transport from liner to aeroplane will be as at present by tender to the Deepwater Quay and Customs dépôt at Cobh, thence by road to the aerodrome.

A double-track railway terminating at the Deepwater Quay at Cobh connects with the Irish rail system.

If this scheme develops and the volume of transport warrants, a development scheme that has been investigated before may be undertaken, i.e., the construction of a deep-water jetty for liners at Cuskinny, and the deepening and widening of the harbour entrance and channel up to Cuskinny.

Seaplane Landing Water

See accompanying plan of Cork Harbour. The large stretch of water situated east of a line drawn from Cuskinny to Corkbeg is the most suitable landing water for seaplanes. It is clear off the main channel and is used only by small craft and occasional boats entering the East Channel. There is shoal water over the area at a nearly uniform depth of 1½ fathoms at low water of spring tides, and consequently this portion of the harbour is as calm as an inland sea. Lengths of from 2 to 3 miles are available for seaplanes alighting and taking off. Communication between seaplane and liner or land will be by fast motor tender.

Both for the seaplane and aeroplane services the provision of wireless and the lighting of the landing places are necessary. Haulbowline Dockyard is naturally situated as the dépôt for repairing and overhauling seaplanes. It may later become a seaplane building yard.

CROYDON

THE first passenger to disembark from the Indian air mail liner *Horatius* on its arrival at Croydon shortly after 11 a.m. on Tuesday, July 11, was Susan Adey. She was fast asleep—even after her cradle had been handed out of the 'plane and she had passed the Customs and Immigration officials, she was still unaware that she had arrived. Susan was just ten weeks old and had travelled with her mother over five thousand miles from Basra. She is the youngest child to travel such a distance by air. She enjoyed it, and so did all the other passengers, for she slept nearly all the time. Susan and her mother have come to England to spend the summer, and will probably fly back to Persia in the autumn.

Prince Nicholas of Rumania, brother of King Carol, arrived at Croydon at 3 p.m. on Sunday, July 16, in his own private aeroplane, accompanied by his personal pilot. The Prince's machine is a blue two-seater S.E.T. biplane, bearing his crest of a letter "N" in a circle with the crown over it. The Prince sat in the front cockpit, and handled the controls most of the journey from Paris. At Croydon, where he arrived half a minute ahead of the 42-seater air-liner *Heracles*, he made a perfect landing. On the tarmac a line of limousines two deep waited to convey the Prince and the high officials who had come to meet him back to London. Prince Nicholas quickly removed his flying kit and exchanged greetings with the Rumanian Minister in London and high officials of the Rumanian Legation. He was greeted on behalf of the Air Ministry by Air Vice-Marshal Longmore and Group Capt. Miley. After salutations had been exchanged the Royal visitor left by private car for Claridge's Hotel, London, where he is staying. Prince Nicholas is making a tour of European countries with the object of studying methods of different Air Forces.

Dr. Colyn, the Dutch Prime Minister, left Croydon on the 7 p.m. K.L.M. service for Rotterdam on Friday, July 14. Dr. Colyn, who has been attending the World Economic Conference in London, will return by K.L.M. Air Service, leaving Rotterdam at 9.35 and arriving at 11.25 on Wednesday, July 19.

A high figures of passenger traffic was obtained on Saturday, July 15, when there were 500 people passed through the Air Port.

Cirrus Hermes Engineering Co. had an unusually busy week in their repair section. The "Moth" aeroplane GAACY, belonging to British Air Transport, was one of the machines to be brought in for repair.

I understand from one of the directors of International Airlines, the company, which has recently been formed with a nominal capital of £100, that a substantial increase of capital will shortly be registered, and that the amount will be ample for working purposes.

The total number of passengers for the week was 2,613. Freight, 91 tons 14 cwt.

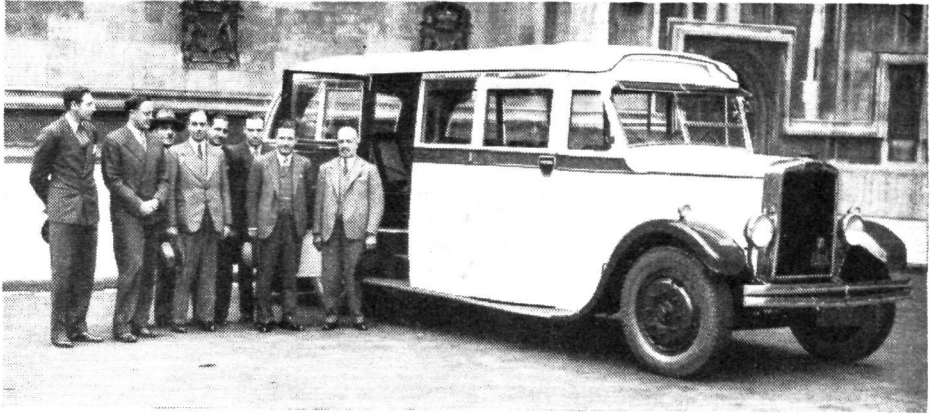
HORATIUS.

FROM HESTON

DURING the short breathing space imposed by adverse weather reports before his Atlantic flight, Mr. Ulm is a daily visitor to Heston, where his machine is being thoroughly overhauled; and on July 11 Mr. and Mrs. Mollison flew over from Bristol in a "Puss Moth" to greet him. Mr. Mollison spent the afternoon at Heston inspecting the machine and talking over plans with Mr. Ulm and his companions, and Mrs. Mollison, who had to keep an appointment in London, joined them for tea later.

All three engines of the *Faith in Australia* are having a top overhaul, and samples of the large quantity of sand which collected inside them during three hours' flying through a sandstorm are being taken for examination. A 110-gallon petrol tank is being removed from under the pilot's cockpit to lighten the machine. Early in the process of overhaul, an Australian mouse made a hurried exit from the upholstery and is now at large!

Arrangements inside the machine are very interesting. A still is carried in order that sea water can be distilled for drinking. The top of the wing is painted red so that the machine may be easily located from the air in the event of a forced landing. An axe is provided for crash extrication or Swiss Family Robinson equipment for "making do" in desert places. The wireless installation is very complete, and is capable of receiving on all wave lengths between 17 and 2,000 metres, and transmitting on 900, 600 and 34 metres. The chronometer, very important in long-distance



FOR FAST TRANSPORT: Misr-Airwork are using Leyland "Cub" coaches with special bodies to transport their passengers between Alexandria and Cairo. The first of these is here being shown to Talaat Harb Pasha (right) and members of the Egyptian delegation to the World Economic Conference. On the left of the group are Mr. N. Norman and Mr. A. Muntz of Airwork, Ltd. The inside of these coaches approximates to the arrangement of the "Dragon" from which the passengers will be transferred.

(FLIGHT Photos.)

navigation, is suspended on cords in the machine, which according to Mr. Allen, the navigator, is an ideal arrangement. Special flares, which ignite on touching water and give out smoke by day and flame by night, are used for calculating drift when flying over the sea.

Capt. T. Neville Stack, piloting the D.H. "Dragon" which will be used by Iraq Airwork, Limited, for special charter work in the Middle East, covered the 1,100 miles from Heston to Rome in a day, leaving early on July 12. He is carrying as a passenger Com. P. H. Baker, who will alight in Cyprus and proceed by sea to Egypt, where he is taking up the duties of General Manager to Misr-Airwork S.A.E. in Cairo.

The British Air Navigation Company carried 41 passengers to Le Touquet during the week-end, amongst whom were the Earl of Dalkeith, Lord Carlisle, Lady Dufferin, Sir Hugh Seely and Capt. Coats. Lord Borodale and the Marquess of Donegall also flew to Le Touquet, piloting themselves.

Press photography from Birkett Air Service machines

this week has included the train smash at Penrith, the wedding of the Earl of Warwick and Miss Rose Bingham, the big East London fire in a chemical factory, the opening by the Prince of Wales of the new pier at Weymouth, and the motor race through the streets of Douglas, Isle of Man, from which Capt. Birkett made the return journey of 265 miles in 2 hr.

Miss N. Heaton, who has just taken her "A" licence at the age of 17, is one of several American women who are making their first hops from Heston.

Anyone who has spent a summer evening at Heatherden Hall, and remembered the associations of that historical country house over a cocktail on the edge of its superb swimming pool, will be glad to hear that special terms have been arranged with the management for Heston Club members. An evening in these delightful surroundings should prove a fine finish to a day's flying, and a stay at Heatherden for golf and a rest from business will appeal to many whose responsibilities will not allow them to go far away from London.

FROM THE CLUBS

THE BROXBOURNE MEETING

THE Herts and Essex Aero Club has justly gained the reputation of being one of the most cheery and energetic of our younger flying clubs, and as most pilots are lively people, it is not surprising that a large number of them went to Broxbourne on Saturday, July 15, for the Club's Annual Display.

The display was declared open by Miss Margot Grahame, one of a number of film celebrities, who arrived during the afternoon, to the great delight of the film "fans" present. Mr. Ben Lyon, who took the leading rôle in "Hell's Angels," and who recently came over to England from Hollywood, spent the afternoon on the aerodrome. Mr. Lyon is a very keen pilot, and owns a Stinson "R" monoplane ("Lycoming"), of which he makes good use when at home. He has done a large amount of flying in England, both at Broxbourne and Hatfield.

The opening ceremony was followed by a parade and fly-past. The machines taking part were five "Moths" ("Gipsy" and "Cirrus"), two "Puss Moths" ("Gipsy III"), two "Swifts" ("Pobjoy"), a "Martlet" ("Genet"), and a Spartan three-seater ("Hermes"). Of these, a "Puss Moth" and a "Swift" were owned by Shell-Mex and B.P., Ltd., the second "Puss Moth" was from the Dominion Motor Spirit Co., and the remaining "Swift" was the machine in which Flt. Lt. Edwards gained second place in the King's Cup Race last week.

Mr. de Greeuw went up with Mr. Roger Frogley, the Chief Instructor of the Club, in a "Moth," and did a perfectly-timed descent, landing about 75 yards in front

of the Club enclosure. Mr. de Greeuw, who was using a British Russell Lobe parachute, made another equally fine drop towards the close of the display.

Mr. "Buster" Frogley and Mr. Duncanson, both in "Moths," endeavoured to "bomb" a Riley "Nine," which, despite the fact that it was carrying four persons, proved too much for its attackers, though Mr. Frogley twice scored "inners."

The Comper "Swift" ("Pobjoy") was demonstrated by both Flt. Lt. N. Comper and Mr. G. Lowdell, the Chief Instructor at Brooklands, the former specialising in tight, vertically-banked turns in front of the enclosures. Mr. Lowdell did some excellent aerobatics, well placed, so that everyone present could see him without trouble. Later, he took up a "Moth" ("Gipsy I") belonging to the Brooklands School of Flying, in which he had arrived at the Display, and proceeded to do what the programme called "Lunabatics." The moon was in the last quarter on Saturday, and, judging from Lowdell's display then, we would very much like to see him in the throes of his "Lunabatics" in about a week's time!

This year, the Club was fortunate in securing R.A.F. support, and four Bristol "Bulldogs" ("Jupiter VII F.") of No. 29 (F.) Squadron came over from North Weald, which is near Broxbourne. The first part of their display consisted of Flight Air Drill, which was well up to the usual R.A.F. standard, and each manœuvre was easily visible to all the crowd. The flight carried out "Flight V," "echelon," "line astern," and "line abreast,"

changing from one formation to another with beautiful precision. Meanwhile, the fourth "Bulldog" took off. This machine represented an enemy bomber, and flew slowly across the aerodrome with its tail well down. The three fighters broke formation, and commenced a somewhat cautious attack on the lone "bomber." We were glad when the announcer explained over the microphone that, during peace time, machines are not allowed to approach within a certain distance of each other during demonstrations of this kind. After flying across the aerodrome, the "bomber" retraced its course, and the attack was repeated, thus ensuring that everyone had a good view of each manoeuvre. This event was concluded by a dive past in flight formation, after which the machines flew back to North Weald.

Three members of the Club gave a demonstration of formation flying in "Moths," which, considering the limitations imposed by low-powered machines for this type of work, was very good. Their "Prince of Wales" feathers" was particularly commendable, the leader executing a very tight loop indeed, though their altitude was rather less than we like to see maintained in these displays.

A Miles "Hawk" ("Cirrus III") flew over and gave

a very convincing demonstration of its excellent speed range and flying qualities. Its slow flying parallel to the public enclosures was favourably commented on by more than one pilot present.

"Grass track car racing" was listed as one of the events. Four ultra-light cars constructed at Broxbourne, and fitted with motor-cycle engines, raced round a track marked on the aerodrome for prizes presented by Mr. Ben Lyon.

A Percival "Gull" (Napier "Javelin"), flown by Mr. Mark Lacayo, arrived during the afternoon, and gave a demonstration of high-speed flying and aerobatics. The Hendy 302 ("Hermes IV"), belonging to Mr. C. S. Napier, also came over late in the afternoon. The largest machine present was the Westland "Wessex" (three "Genet Majors"), belonging to the Portsmouth, Southsea and Isle of Wight Aviation Co., Ltd., which was used for joy-riding.

Although the Club has 350 members, and in two and a-half years 104 men have been taught to fly, so far not one lady has been trained. Let us hope that the first (to be) was at Broxbourne on Saturday, and that by now she has realised what she has been missing.

YORKSHIRE AEROPLANE CLUB

Club machines flew approximately 26 hr. last week, three pupils, Messrs. S. D. Goldthorp, S. P. Gardner and G. D. Smith doing first solos. Visitors included an N.F.S. Desoutter from Blackpool, Lord Malcolm Douglas-Hamilton in his "Moth," a "Fox Moth" of Midland & Scottish Air Ferries, and Mr. G. Shaw on his "Avian." The results of the Yorkshire Trophy Race and the Sherburn Short Handicap, which were flown last Sunday, July 16, are given in the accompanying tables.

YORKSHIRE TROPHY RACE

Pilot	Aircraft and Engine	Starting Time	Finishing Time	Average Speed m.p.h.	Place
Strange	"Clipper" (Pobjoy R)	H. M. S.	H. M. S.	88½	7
Scott	"Moth" (Gipsy I)	13 00 00	15 10 11	95½	
Kinnear	"Moth" (Gipsy I)	13 07 04	Retired at Grimsby	96½	6
Gardner	"Cadet" (Genet-Maj, 7 cy.)	13 09 14	15 08 51	112½	1
Probyn	"Hawk" (Cirrus III)	13 18 03	15 00 48*	103	8
Henshaw	"Swift" (Pobjoy R)	13 19 50	15 11 48	122	5
Moody	"Active I" (Hermes II B)	13 27 50	15 02 14	127	3
Worrall	"Active II" (Gipsy III)	13 30 42	15 01 33	131½	2
Percival	"Gull" (Javelin IA)	13 33 23	15 01 14	151½	4

(* Start arranged for finish at 15 hrs. 00 min. 00 sec.)

SHERBURN SHORT HANDICAP
THREE CIRCUITS OF COURSE—TOTAL, 18 MILES

Pilot	Aircraft and Engine	Start m. s.	Finish m. s.	Average m.p.h.	Place
Heat I					
Strange	"Clipper" (Pobjoy R)	0 00	11 36	93½	1
Scott	"Moth" (Gipsy I)	0 55	12 14	95½	5
Diamant	"Puss Moth" (Gipsy II)	2 50	12 10	115½	3
Henshaw	"Swift" (Pobjoy R)	2 54	11 57	119½	2
Worrall	"Active II" (Gipsy III)	3 33	12 13	124½	4
Heat II—					
Irving	"Moth" (Gipsy I)	0 00	11 35	93½	5
Kinnear	"Moth" (Gipsy I)	0 26	11 34	97	4
Gardner	"Cadet" (Genet-Maj. 7-cy.)	1 42	11 32½	110	2
Garnet	"Puss Moth" (Gipsy III)	2 14	—	—	6
Moody	"Active I" (Hermes IIB)	2 39	11 33	121½	3
Percival	"Gull" (Javelin IA)	3 52	11 32	141	1

FINAL

Pilot	Start m. s.	Finish m. s.	Speed m.p.h.	Place
Strange	0 00	11 28	94½	1
Gardner	2 18	12 04	110½	4
Diamant	2 50	12 12	115½	6
Henshaw	2 54	11 55	120	2
Moody	3 15	12 05	122½	5
Percival	4 28	12 01	143	3

LONDON GLIDING CLUB

On Sunday, July 9, the natural turbulence of a gusty 25-m.p.h. S.W. wind was increased by its rough-and-tumble along the ridge. Soaring was extremely interesting and only possible for the better machines, which were confined mainly to the neighbourhood of the projecting Bowl.

A primary machine was flown once, but was discarded for the day owing to its sluggish controls. The *Prüfling* repeatedly descended and came to no harm, in spite of unintended minor aerobatics. In the absence of the *Crested Wren*, which is being prepared for another journey northwards, the soaring was left to the *Willow Wren* and to the Club's *Professor*. During the afternoon both of them were caught in an immense surge of lift in which they were able to cruise, together, out from the ridge for more than a mile, eventually returning to the landing ground. Aneroids in both machines showed a maximum height of 700 ft. above the launching point, obtained over the plain. In the course of a full day's flying a member of the Club, who comes from Cranwell, obtained his "A" and "B" in the *Prüfling* and his "C" in the *Professor*, an amazing performance under the circumstances. The *Willow Wren* behaved extremely well in the bumps, her controls being incredibly firm without being too sensitive. She inspires such confidence that any mediocre pilot can soar her indefinitely at his first attempt. This has now been demonstrated repeatedly. Possibly her strongest point is her balance. Cpl. Manuel has received an order for a new machine, to be ready by the end of September.

CINQUE PORTS FLYING CLUB

The programme for the International Flying Meeting which the Club has organised for Saturday next, July 22, and which was described in FLIGHT for July 13, has attracted a large number of pilots, and the meeting already (D.V.) looks like being a success. The final of the race for the Cinque Ports Wakefield Cup will be flown as the opening event of the programme on the Sunday. A dance (dress optional) is being held at the Majestic Hotel on Saturday evening, at which all visitors will be welcome. Lympne is an Air Ministry aerodrome and landing and hangar charges are therefore usually made to those using it. The present occasion would, however, in view of its international character, seem an appropriate one for the Ministry to show its desire to foster the growth of international air relationships by waiving these charges. The Ministry does not appear to think so, and we are informed that the Club will have to pay landing fees for all visitors as well as surrendering a proportion of its gate money. This latter seems particularly hard, because the entertainment of all the foreign visitors will naturally be a charge on the Club. The ways of the Air Ministry are, however, inscrutable. They have already "charged" most of the civil operators off Croydon aerodrome, so we should not be surprised to see the Cinque Ports Club take their custom away from Lympne. If they go they will have the satisfaction of knowing that they are leaving many improvements, particularly sanitary ones, behind them, even though they were only allowed to install them on the understanding that the fittings would not be treated as tenants' fixtures!

NORTHAMPTONSHIRE AERO CLUB

Flying hours during the past week have not been up to the average owing to bad weather and high winds. Messrs. R. Castell and P. Gunnings have successfully passed tests for "A" licences, which have been granted them. Mrs. G. R. D. Shaw, Messrs. Bosworth and R. Chater-Lee have been busy putting in the necessary solo hours for

licences, and Mr. P. H. Coleman has carried out his first solo. Visitors to the aerodrome included Col. L. Strange on the Spartan "Clipper" and Capt. Ledlie on the Junkers G.13. Capt. G. R. D. Shaw, of Whilton Lodge, has just purchased a "Gipsy I Moth," and Mr. P. Tyzack and Miss D. Tyzack have ordered one of the latest Avro "Cadets." Miss D. Tyzack, Miss M. Tyzack, Mr. and Mrs. H. Deterding, Mr. E. Danson and Mrs. Deterding's sister have just returned from an aerial tour of Europe, in which they visited Germany, France, Austria, Hungary and Switzerland. Miss D. Tyzack had the alarming experience of engine failure over some very bad country near Budapest, but managed to get down in a field of wheat. The Club wish to offer to Mr. Thorn the best of luck in his new appointment, and hope he will still be a frequent visitor. Flt. Lt. Palmer, who is to take his place, was for some years instructing at the de Havilland School of Flying at Hatfield.

THE R.A.F. RESERVE FLYING CLUB

The R.A.F. Reserve Flying Club are holding their official opening ceremony on Saturday, July 22, 1933, starting at 2.30 p.m. By kind permission of the Air Council the ceremony will be supported by No. 1 (Fighter) Squadron, the Central Flying School and the R.A.F. band. The afternoon's programme will include a ceremony with the Club's machine, a fly past of instructors from the R.A.F. Reserve Training Schools, a demonstration by Central Flying School instructors, a parachute descent, a demonstration on a Hawker "Fury" by Flt. Lt. P. W. S. Bulman, a fly past of the squadron of the Auxiliary Air Force, a demonstration on a "Tiger Moth" by Flt. Lt. W. E. P. Johnson, and flight aerobatics by No. 1 Squadron on "Furies."

BROOKLANDS

Strong winds and squally weather have considerably hampered instructional flying during the week, the total hours' dual and solo amounting to 54. The School instructors have, however, been kept busy helping out Brooklands Airways, who have been inundated with work. The Club are pleased to see Sir A. Lindsay Hogg, who has returned to the Club after his accident. Congratulations to Mr. G. E. Lowdell, who successfully flew a Wolseley "Tomtit" in the race for the King's Cup, and was not eliminated until the third circuit. Mr. Thorn is leaving Sywell to help on the Sales Staff at Brooklands. Mr. R. L. Palmer has been transferred to Sywell as Chief Instructor in his place. The Club are concentrating on the Inter-Nation Meeting at Lympne, and hope it will be one of the most interesting meetings of the year. In future no instructional flying will be given on Mondays, but machines may be hired by "A" licence pupils, with the permission of the Chief Instructor.

MAIDSTONE AERO CLUB

The Maidstone Flying School is still increasing the number of pupils, and several have recently done first solos. The Maidstone Airport has been appointed an emergency landing ground for the R.A.F. and during next week night flying will take place.

LONDON AEROPLANE CLUB

During the week Mr. S. W. Collier made his first solo flight. Mr. T. C. Place has returned to the Club, and is to be congratulated on having passed his "B" licence medical examination. Among new members whom the Club welcomes are Messrs. E. C. Steiner, R. D. Blackwell, R. T. Woods, E. Nothamn, E. A. Croft and H. E. Stanham.

HANWORTH (N.F.S.)

The Club's flying during the week has been somewhat restricted by bad visibility and high winds. Cross-country flights included those by Capt. Findlay with Mr. Fred Darling to Beckhampton and Chepstow, and to Beckhampton and Tangmere; Mr. Whitelaw to Le Touquet and return; Mr. Bob Everett from Ireland on Sunday, July 9, flying on to Paris on Thursday, July 13; Mr. Cathcart Jones and the Countess of Drogheda to Ireland on Tuesday, July 11, returning on Friday, July 14; and Flt. Lt. R. E. H. Allen with Mr. H. C. Paul to the Continent for the Dieppe Rallye. The Inns of Court Regimental Gymkhana, which was held on Saturday, July 8, went off very successfully. The Countess of Soden and Herr Mertz have both been staying at the Club. The Desoutter which, flown by Capt. Ayre, put up such a fine performance in the race for the King's Cup, is back again on taxi work. The engine was stripped in the workshops after the race and found to be in perfect order. On Mon-

day, July 10, Capt. Findlay and Mr. Llewellyn flew over to Biggin Hill to collect Lord Grimthorpe's "Puss Moth" which force-landed there returning from the Continent on Wednesday, July 12. Mr. Adinsell flew over to Croydon with an urgent letter for South Africa to catch the air mail.

ROYAL NAVAL FLYING CLUB

Rear Admiral A. L. Snagge, Chairman of the Royal Naval Flying Club, presided at the Second Annual General Meeting of the Club, in the R.U.S.I. on Friday, July 14. He pointed out that considerable progress had been made in the past twelve months and that the total membership had now reached 198. Changes which he notified were: Lt. Cdr. Beatty becoming Hon. Treasurer and Lt. G. G. R. Rodd becoming Hon. Secretary. It was with the greatest regret that the deaths of four members was announced, these being: Cdr. L. C. Sharman, Lt. Cdr. P. G. T. Rodd, Lt. Sir Robert Clayton-East and Sub. Lt. R. D. L. Dickinson. Capt. Mark-Wardlaw, R.N., had agreed to become a member of the Committee and to act as liaison officer with the Portsmouth Aero Club, where facilities for members have now been arranged. Other aerodromes where members of the R.N.F.C. may fly being Hanworth, Maidstone, Gravesend, Reading, Nottingham, Hull, Leeds, Blackpool, Stoke-on-Trent, while members are also honorary members of the Surrey Aero Club at Gatwick. The provision of facilities at several overseas aerodromes is also under consideration.

A.S.T. ACTIVITIES IN JUNE

ONE of the principal features of the instruction provided by Air Service Training at Hamble is the number of distinct types of aircraft which is at the disposal of its pupils. During June this was brought out by the use of the A.W. XVI, one of the world's fastest air-cooled fighters. It was flown by Flt. Lt. Veal and Com. Holm, of the Royal Norwegian Air Service, who has been receiving instruction in advanced aerobatics. Señor Manuel Pardo has also been receiving instruction in fighter aerobatics on the "Dual Siskin." The three-engined Avro V, the latest addition to the A.S.T. fleet, has continued to be in demand during the month. The wireless-equipped Avro 626 has been in use by Messrs. Beckmann and Williams, who are expected very shortly to obtain their W/T air operators' licences. Mr. G. W. Taylor, who attended recently for the short wireless course, has obtained his licence. Herr August Hell has obtained his blind flying certificate. Mr. E. N. V. Everitt, who joined during the month for an instructors' course, has passed out with an A.S.T. instructors' certificate in category "B." Dr. Pfeiffer (U.S.A.) and Mr. Hamilton have obtained their "A" licences. Flt. Lt. Upton and Messrs. Bhandari (India) and Coull (South Rhodesia) have joined for the ground engineers' course. Flt. Lt. Upton is also working for his 2nd-class civil air navigators' certificate, the new class for the October examination having just started. A creditable effort during the month was the winning by Mr. Charles Gardner of second place in the recent *Morning Post* Cross-Country Race. Mr. Gardner was passed by the winner in the last hundred yards. The competition was designed not only as a race but to bring out all the navigational qualities and acumen of the competing pilots. Mr. Gardner is a long-course pupil of A.S.T. who has already obtained his navigators' certificate, his W/T air operators' licence, his "X" ground engineers' licence and his A.S.T. blind flying certificate. He is shortly expecting to complete his training by obtaining his "A" and "C" ground engineers' licences.

THE DE HAVILLAND SCHOOL OF FLYING

THE flying time for week ending July 14 was 79 hr. The Royal Air Force Reserve Club's official opening ceremony is to be held at Hatfield Aerodrome on Saturday, July 22. (Details of the programme are given elsewhere in this issue.) Mr. C. A. Pike, accompanied by Mr. Griffiths, of the Williamson Manufacturing Co., returned from a tour of Brussels, Warsaw, Riga, Helsingfors, Stockholm and Copenhagen, where they demonstrated the new Eagle IV camera made by Williamson Co. The machine used was a "Puss Moth," the flying time 39 hr. and the approximate distance 300 miles. Mr. George Duller is as keen as ever on flying. He arrived in a Spartan during the week. Lady Loch returned from Edinburgh in one hop of 4½ hr. in foul weather. She left for Tangmere on Friday for the week-end. The swimming pool and squash courts are proving popular with private owners.



THE WINNER : The Farman 358 (100-h.p. Hispano-Suiza) flown by Marcel Langlois.

THE ANGERS "12 HOURS CONTEST"

THIS Contest for Tourist two-seater, or more, planes equipped with engines limited to a total maximum cylinder displacement of 8 litres (488.8 cu. in.) took place at the Avrillé Aerodrome (Angers) on Sunday, July 2. It consisted in covering the longest distance possible in twelve hours' time, thus combining an endurance test with a speed competition. The planes entered in this Contest were limited to machines, at least two-seaters, constructed in France. Foreign engines were, however, admitted, and while the maximum cylinder displacement was limited to 8 litres, superchargers and any kind of fuel could be used. The combined weights of the two persons composing the crew were required to be at least 160 kg. (352 lb.), and any deficiency in this figure had to be made up by ballast. Fifteen kg. (33 lb.) of baggage per person was also required to be carried in the plane. No change of crews, during the flight, was permitted. The substitution of a propeller, or the opening or replacement of an engine were also prohibited. Landings for refuelling were permitted, the time taken for which to be included in the elapse time of the contestant in flying over the course. Refuelling facilities were furnished at the Angers Aerodrome.

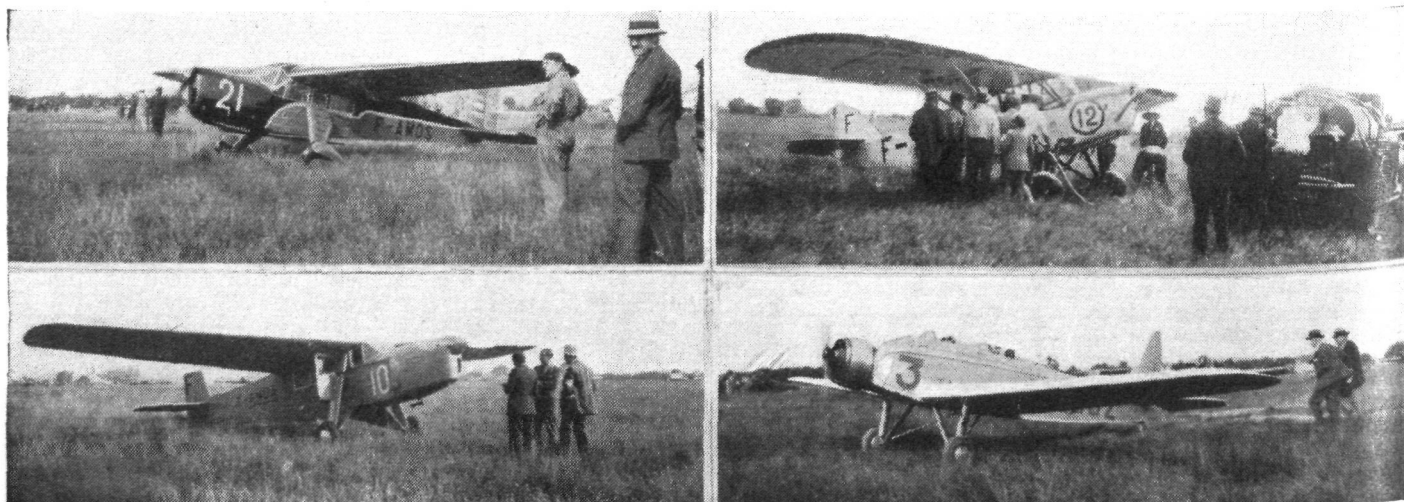
The course was a triangular one of about 46 km. (29 miles approx.) in length, comprising a circuit consisting of the Avrillé (Angers) Aerodrome, Corze, and Juvardeil. The start and finish took place at the Avrillé Aerodrome. A pylon was erected at one end of the airport and another one about 2,000 ft. (600 m.) distant at the other end of the field. The contesting planes were obliged to encircle both of these pylons, thus flying along the length of the field in full view of the spectators.

A large crowd attended the Contest, among whom were Mr. Pierre Cot, the Air Minister, General Barres, the Inspector General of the French Air Force, Mr. Louis Couhe, the Inspector General of Commercial Aviation, and numerous local officials, the Commandant Louis Hir-

schauser, the Chief of Tourist Aviation in the Air Ministry, was the Commissaire General of the meeting. Favoured by perfect weather, 17 planes started, being sent away in groups of four and five at intervals of about 3 min., beginning at 8.27 a.m.

The low-wing, open-cockpit, two-seater Farman monoplane, type 358, equipped with a Hispano-Suiza, six cylinders in line, 100-h.p. water-cooled engine, took the lead at the start, and held it to the finish, although hard pressed in the beginning by several planes in the race. It was piloted by Marcel Langlois, an amateur airman and member of the Aero Club of France, who took turns "at the stick" with Johanny Burtin, a well-known pilot. Another Farman plane of similar type, but equipped with a "Gipsy Major" 130-h.p. engine, finished second, while a third plane of similar Farman type, but equipped with a "Gipsy III" 120-h.p. engine, finished third in the contest. These last two planes were piloted by Maurice Finat and George Lebeau respectively. The fourth place was taken by a Morane-Saulnier two-seater open-cockpit monoplane, also equipped with a "Gipsy III" 120-h.p. engine. This machine was piloted alternatively by Robert Morane, the constructor, himself, and Michel Detroyat, his chief pilot. Other tourist planes of the latest types were also among the contestants entered in the race, comprising the following cabin monoplanes, a Bernhard 201, and a Potez 43, both equipped with 130-h.p. "Gipsy Major" engines, and two Caudron "Phalenes," equipped with 130-h.p. Renault "Bengali" motors.

Miss Helen Boucher and Miss Jacob were the sole feminine crew to make the circuit, and they thus won the special prize given in his class. The aviatrixes flew a low-wing open-cockpit two-seater Mauboussin "Zodiac" monoplane, equipped with a 60-h.p. geared Salmson radial air-cooled engine. This engine, which was produced this year by the Salmson Co., turns at 2,700 r.p.m., has a compression of 6:1, and a 14:27 ratio reduction gear



THE ANGERS "12 HOURS CONTEST" : Some competing machines : Top, left, Assolant's Bernhard 201 (130-h.p. "Gipsy Major"), right, Regnier's Potez 43 (130-h.p. "Gipsy Major"). Bottom, left, Strube's Farman 400 (Renault "Bengali"), right, Miss Helene Boucher's Mauboussin-Zodiac 17 (60-h.p. geared Salmson).

"Straws"

In the King's Cup Air Race which was won on
K·L·G Plugs for the twelfth successive year

7 out of **7** GIPSY MAJOR engined aircraft

6 out of **6** POBJOY engined aircraft

4 out of **4** CIRBUS HERMES engined aircraft

4 out of **4** NAPIER engined aircraft

3 out of **3** WOLSELEY engined aircraft

8 out of **10** GIPSY III. engined aircraft

were fitted with

K·L·G

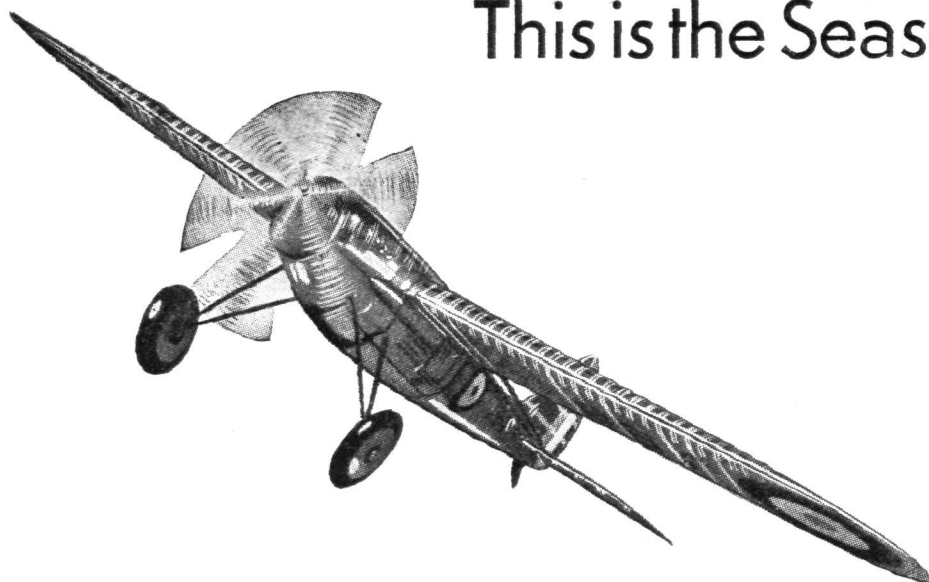
PLUGS

"Straws show which way the wind blows"

K·L·G SPARKING PLUGS LTD., PUTNEY VALE, LONDON, S.W.15.

Save time by using the Air Mail.

This is the Season for FROG flying



FROG models bearing the insignia of six different foreign countries are now available.



The patented easy winding gear winds-up the engine in seven seconds.

In the Spring and early Summer the intensive training of the Royal Air Force begins, and on every open space the pilots of the future are flying the scale model FROG aeroplane and learning new ways of adjusting controls so as to produce new stunts and manoeuvres.

When you have read the book of instructions you will become really skilled in flying the FROG and will find many new things that you can make it do. By careful adjustment of the controls this scale model aeroplane can be made to behave in the air like the Interceptor Fighter of which it is a model. This fascinating art is learnt by studying the instruction book.

The FROG is NOT A TOY; it is an actual scale model of an Interceptor Fighter, the most powerful weapon known to modern air warfare.

The FROG is CRASHPROOF because when it hits anything the main parts drop off without damage and can be fitted on again in an instant.

The FROG can be made to RISE OFF THE GROUND and fly 100 yards at a height of 70 feet, at a speed of 650 feet per minute, which is the correct scale speed for an Interceptor Fighter.

TO JOIN THE FROG CLUB and obtain a club charter and badge of skill, see the special leaflet in every box, or write to the sole concessionaires—Lines Brothers Ltd., Dept. "F", Tri-Ang Works, Morden Road, Merton, London, S.W.19.

FROG CRASH-PROOF SCALE MODEL AEROPLANE

Made in England by INTERNATIONAL MODEL AIRCRAFT LTD. (World-Wide Patents)

Sole Concessionaires

Lines Bros. Ltd. TRI-ANG WORKS, MORDEN RD. MERTON, S.W.19

On sale at Stores and Toy Shops. In case your nearest dealer has no supplies, write to Lines Bros.

‘— a good hangar at a reasonable price’

An extract from a letter received from A. V. Roe & Co. Ltd. relating to the hangar shown, supplied by Boulton & Paul Ltd.



"Flight" Photo

As Aircraft Manufacturers and Structural Engineers we claim to possess special knowledge and facilities for the supply and erection of hangars and aerodrome buildings.

Hangars have been supplied by us to the Air Ministry, Saunders-Roe Ltd., Brooklands Aviation Ltd., Wight Aviation Ltd., A. V. Roe & Company, Hillmans Airways, and aeronautical concerns both at home and abroad.

BOULTON & PAUL LTD., NORWICH, ENG.

London: 139, Queen Victoria St., E.C.4

Offices at Birmingham, Brighton, Manchester, and Johannesburg, S.A.

Kindly mention "Flight" when corresponding with advertisers

ANGERS "12 HOURS CONTEST"

Place	Machine and Engine	Pilot and Passenger	Distance		Speed	
			Km.	Miles	K.p.h.	M.p.h.
1	Farman 358, 100-h.p. Hispano-Suiza	Marcel Langlois Burtin ..	2,463	1,530	205	127·3
2	Farman 359, 130-h.p. "Gipsy Major"	Maurice Finat, Miss Alec Plumian	2,385	1,482	199	123·6
3	Farman 359, 120-h.p. "Gipsy III" ..	Georges Lebeau, Cottier ..	2,323	1,443	193	120
4	Morane-Saulnier 340, 120-h.p. "Gipsy III" ..	Michel Detroyat, Robert Morane	2,135	1,326	180	110·8
5	Farman 400, Renault "Bengali" ..	Strube, Garchot	2,011	1,249	169	105
6	Farman 356, Renault "Bengali" ..	Maurice Arnoux, Brabant ..	1,992	1,238	166·5	103·4
7	Caudron "Phalène," Renault "Bengali" ..	Burlaton, Mottan	1,984	1,233	166	103·1
8	Caudron "Phalène," Renault "Bengali" ..	Delmotte, Herbay	1,982	1,231	166	103·1
9	Farman 350, 95-h.p. Renault ..	Saunier, Boissaret	1,967	1,222	164	102
10	Farman 231, 95-h.p. Renault ..	Marcel Lefèvre, Mrs. Lefèvre	1,914	1,189	159	98·8
11	Farman 234, 95-h.p. Salmson ..	Puget, Ribaux	1,889	1,174	157	97·5
12	Bernhard 201, 130-h.p. "Gipsy Major"	Assolant, Dounurieu ..	1,823	1,133	157	97·5
13	Mauboussin-Zodiac 17, 60-h.p. geared Salmson	Nicole, Rigavx	1,650	1,025	137	85
14	Mauboussin-Zodiac 17, 60-h.p. geared Salmson	Miss Helene Boucher, Miss Jacob	1,645	1,022	137	85
15	Potez 43, 130-h.p. "Gipsy Major" ..	Regnier, Ruballot	1,610	1,000	134	83·2
16	Morane-Saulnier "Moth," 85-h.p. "Gipsy" ..	Herman, Laigneau	1,582	983	131	81·4
17	Farman F.40, 80-h.p. Renault ..	Gaubert, Mrs. Gaubert ..	1,057	656	88	54·6

The ancient Farman "Cage a Poule" (chicken cage), piloted by Louis Gaubert, a "Veille Tige" war-time aviator, was also among the starters.

The winner of the contest, the Farman type 358 monoplane, similar types of which also won second and third places, is a new machine produced this year by that company. It is designed especially for tourist use, and can be fitted with any of the standard engines of about 120 h.p. It is of wooden construction throughout, the fuselage and wings being covered with plywood. It is equipped with brakes, Farman shock absorbers, and its undercarriage has a wide track (6 ft. 1 in.).

The general characteristics are as follow:—Length, 6,38 m. (21 ft.) ; wing spread, 9,11 m. (30 ft.) ; height, 1,9 m. (6 ft. 1 in.) ; wing surface, 14,4 m.² (155 sq. ft.) ;

maximum speed, 200 km./hr. (124 m.p.h.) ; cruising speed, 170 km./hr. (105 m.p.h.) ; flight radius (no wind prevailing), 800 km. (500 miles).

The Hispano-Suiza, type 6 Pa., six-cylinder in line water-cooled engine, which equipped the winning plane, has a rating of 100 h.p., with 145 h.p. maximum. The bore is 110 mm., the stroke 140 mm., the cylinder displacement 7,9 litres. The r.p.m. is 2,000, and the compression ratio of 5.5:1.

The following prizes were awarded:—To the winner, 40,000 francs in cash, together with a cup presented by the

Aero Club of the West of France (l'Aero Club de l'Ouest). To the second plane, 10,000 francs in cash, presented by Mr. Cardi, the proprietor of the "Petit Courrier" (a newspaper of Angers). To the third plane, 5,000 francs in cash. To the 4th-16th planes, 3,000 francs in cash each. To the plane whose crew shall be composed of women, finishing first, a special prize of 3,000 francs. To the crew of the plane finishing first among those not having won any prize, 2,000 francs in cash.

Of the 17 planes starting in the race, all finished the contest and so qualified for the prizes. R. C. W.

THE FLYING DOCTOR IN AUSTRALIA

"Achievement is but a milestone on the highway of Progress. The end of the journey lies ever beyond"

It seems a peculiar contradiction that to one of the most undeveloped parts of the world must we look for undeniable proof of the utility of the most modern development which civilisation has achieved, namely, aviation. A multitude of people are still inclined to regard flying as an inhuman invention responsible for the unnecessary destruction of many good lives ; even the superior brains of politicians are not altogether immune from this bigoted delusion. It is, therefore, a pleasure to give a little publicity to an instance where aviation is the means of saving countless lives and preventing much suffering to those afflicted with illness and disease.

The Continent of Australia contains in its interior vast tracts of country sparsely populated and with no means of quick communication with the more civilised parts. It is nothing uncommon for a man to live hundreds of miles from his nearest white neighbour, and the only methods of transport being camels or perhaps an ancient car. Medical attention for such people has in the past been, and still is, a great problem.

Over 20 years ago the Rev. John Flynn, of the Australian Inland Mission, refused to accept as inevitable such



stark reminders of the insufficiency of available medical aid as small children's graves, which need never have been dug, stories of strong men who died 1,000 miles inland, and, greater still, the constant dread of the anxiety of lonely motherhood. When on camel patrol through his vast parish (almost two-thirds of the continent) he dreamed of a chain of hospitals. Not being only a dreamer, but a practical idealist, he endeavoured to interest the more fortunate town dwellers in his schemes, but, as is generally the case where the interests of others are concerned, found little or no enthusiasm in his audiences. So he had to content himself with carrying on his camel patrols, although he found them slow, but sure (90 per cent. sure, 100 per cent. slow), until he was provided with a second-hand car. Finally, backed by hard-headed business men and with the solid help of women in towns and country, the dream came true. Thirteen hospitals were gradually established, each staffed with two certificated nurses. Even this was not enough, for there were not enough doctors to go round, and the great distances between the stations necessitating long journeys wasted such a lot of valuable time. John Flynn watched the growing developments of wireless and

aviation, and realised at once that here was the only solution to the problem.

In May, 1928, the first Civil Aerial Medical Service in the world was inaugurated at Cloncurry, in Queensland. Dr. K. St. Vincent Welch was appointed the first flying doctor. His plane—appropriately named "The Victory"—a D.H. 50, carrying pilot, doctor, nurse and patient, spread a mantle of safety over an area as large as that of Germany, Austria, Switzerland and Denmark, all put together. In the same year Dr. Welch flew 20,000 miles, saw 255 patients, and held 42 consultations at 26 different centres. At first the landing grounds used were of a very makeshift nature, but this was soon remedied; that there was not a single mishap during this early period is high praise for the pilot and Q.U.A.N.T.A.S., who made themselves responsible for the upkeep of the machine. In November of the same year the central station at Cloncurry was equipped, and baby wireless transmitters, with foot-pedalled generators and a sending radius of 600 miles, were installed at isolated places, which had no other means of speedy communication with the Centre. These sets are marvellous in their simplicity and efficiency. At first the home operator had to learn Morse, but recent improvements enable messages to be tapped on an automatic keyboard similar to that of a typewriter. The reply is sent direct to the patient by wireless telephone. The set is easy to instal, it costs under £75, and the annual upkeep is about £5. There is always an operator on duty at Cloncurry, and at fixed times every day each station communicates with the Centre, which acts as a test to ensure that the sets are in working order.

The following little story illustrates what conditions were like in the past and to what an extent this aerial medical service will alleviate human suffering. During a gold rush some years back a man was thrown off a horse and badly injured. His mates procured a buggy and set out with the patient for the nearest town, some 300 miles distant, where there was a man who might be able to do something for the injured one. This man's name was Mr. F. W. Tuckett, and he had been presented by his fellow-townsmen with the honorary degree of "W.B.L.," which stands for "Whole blooming lot," for Mr. Tuckett was Resident Magistrate, Warden, Commissioner of Roads, Chairman of the Licensing Board, Protector of Aborigines, Registrar of Births, Marriages and Deaths, Master of Post and Telegraph Office, and Bush Doctor. There are other reasons besides Poo-Ba's for multiplying offices; one is shortage of men. Mr. Tuckett examined the patient, and as the injury was beyond his simple knowledge, he got in touch with the local hospital, just over 1,000 miles away. The doctor at the other end prescribed an operation. Mr. Tuckett, with no instruments other than a penknife and a razor, and no anæsthetics or drugs except permanganate of potash, then proceeded to do the operation himself, all the time working on instructions which he received over the wireless from a doctor 1,250 miles distant. The operation was successful, though the patient died soon after



Sketch map showing the area covered by the aerial ambulance service, and also the proposed areas.

from malaria, but his sufferings during the actual time of the operation can best be left to the imagination.

The Flying Doctor administers first aid, conducts operations on the spot if necessary, conveys patients to hospital, and flies over and consults other doctors in less sparsely settled districts. The initial experiment has proved an outstanding success, and it is hoped to establish in the near future a number of similar bases. Six such bases would be sufficient to practically cover the whole of the vast interior, which, theoretically at any rate, could be worked by six doctors. At present the expenses are met by the Australian Inland Mission, subscriptions from employers and employees, Local Committees and Societies, private donations and Government subsidies.

To increase the efficiency of the service in the future, Dr. W. D. Walker, B.Sc., M.D., B.S., has come over to England to study the aviation side of medicine, and he is at present attached to the R.A.F. station at Digby, where, among other things, he is also learning to fly, and hopes to become a proficient pilot before returning to Australia.

This medical air service is probably the most useful service which aviation has rendered to mankind. It has annihilated distance, has banished isolation, and has been described as one of the greatest advances in public health in this country. Here, then, is concrete evidence that this so-called menace to the peace of mankind, and to the useful advance of civilisation, has in the arid wastes of a great and spacious continent, made sparsely populated areas safe for the wives and children of pioneers, and home life, which is the very essence of a country's health and prosperity, is being made the joy of life where before it was a burden of anxiety and suffering.



A PATIENT BEING PLACED IN THE A.I.M. AMBULANCE PLANE: A striking contrast to the Camel ambulance transport, used in the early days, shown on the preceding page.

AN AMERICAN FOUR-SEATER

A "WACO" (210-h.p. Continental) four-seat cabin aeroplane has recently been imported from America by Lady Hay Drummond Hay. It was seen at the Household Brigade Flying Club Meeting last Wednesday, June 7. We were fortunate enough to be permitted to try out this machine for ourselves recently, and were thus able to see how the American aviation industry in endeavouring to meet the demand there undoubtedly is in our Dominions and Colonies for a class of machine which might be termed the flying motor-car. This "Waco" is as well finished as the average motor-car, the fabric having been given something over twenty coats of dope and carefully rubbed down between each until it has attained a high and glass-like polish. This certainly makes it look very beautiful from the outside, but it would seem doubtful whether the added weight entailed justifies the inevitable loss of pay load. Inside, the cabin was finished comparable to the outside. The seats were comfortable and were upholstered and the luggage locker was easy to get at. The general fittings throughout were in keeping with the high-class motor-car analogy. From an aerodynamical point of view the machine appeared to handle well with three up. Piloted by Capt. Baker, the take-off appeared to be good, although the landing speed, as one would expect, seemed to be very little below 60. It was very difficult to judge this accurately as the day was bumpy and the machine was only flown for a short while. During the demonstration we did not have an opportunity of flying the machine ourselves other than trying the controls in the air, but it was evident that she handled very well indeed. Our general criticism would be the lack of forward view. The engine fitted is a 7-cylinder 210-h.p. "Continental" cowled-in with the N.A.C.A. type cowling ring. The result was that when taxiing one had a large nose



The "Waco" has large side windows which can be opened. The clean design of its undercarriage should be noted. (FLIGHT Photo.)

stuck up in front of the machine, around which it was by no means easy to see. Likewise when approaching an aerodrome it was necessary to slew the machine from side to side in order to make certain that there was nobody immediately below the machine. Apart from this point the view sideways and backwards was good. The rear portion of the cabin was covered with transparent Cellon as was the roof above the pilot, with the result that one could not only look backwards, but also see the aerodrome when making a turn in to land. We thought the engine somewhat rough and noisy and a consumption of 12 gallons an hour will undoubtedly seem to English ideas a high price to pay for the performance and comfort given. We were only able to fly a short stretch straight and level, during which the cruising speed appeared to be between 105 and 110, but we are assured by Lady Hay Drummond Hay that it is a good deal more than this. We also understand from her that the price of this model works out at about £1,750 in this country, excluding carriage. Summing up, one might say that by adding a high horsepower and sacrificing both landing speed and consumption, the Waco Company has produced a very comfortable four-seater machine well up to motor-car standards of comfort, which is undoubtedly handleable and pleasant to fly, but in which we feel that the noise and forward view might be made somewhat better than they are.



This side view of the "Waco" shows the interplane strut with a wide fairing on it so arranged that it can be rotated to form an airbrake when landing. (FLIGHT Photo.)

King's Cup 'Stalls'

IN the hurry of getting out the very long article on the King's Cup Race last week, we "stalled" rather badly in a few instances, and as some of the errors were not discovered until a considerable number of copies had been printed, we fear that some of our readers may have received some slight shocks. We would ask them to be good enough to note the following corrections. In writing of the start of the machines in Heat 2, it was stated that the "Hawk" was flown by Mr. Miles. This, of course, was not the case. The machine was piloted by Wing. Com. Probyn. In the caption to the photograph of Capt. Ayre it was inferred that he did not get into the final. What was meant was that he missed by seven seconds getting in among the first three. Mr. Henshaw was given credit for having got 160.46 m.p.h. out of a Comper "Swift" with "Pobjoy" engine! Actually, of course, it was Flt. Lt. Stainforth, who got this speed out of a "Gipsy" engined "Swift." In commenting on the starts of the "Puss Moth" flown by Irwin and the "Pobjoy-

Swift" flown by Henshaw, we stated that Irwin was in each case given the inside of the turn. Actually it was the other way about. Henshaw was given the inside. Funny how one makes these silly mistakes, isn't it?

The Air Crash in Nairobi

At an inquest on the bodies of Capt. and Mrs. Ussher, who crashed near M'beya in Tanganyika, it was disclosed that Mrs. Ussher was killed by the crash, but Capt. Ussher took his own life.

Notice to T.M.A.C. Members

An invitation has been received by the Model Aircraft Club from the Brooklands Aero Club to fly models at Brooklands Aerodrome on Sunday, July 30. Tea will be provided. Members desirous of attending are requested to notify the Hon. Secretary, Mr. A. E. Jones, 48, Narcissus Road, West Hampstead, N.W.6, by first post on Saturday, July 29, in order that the Brooklands Club may be notified of the number attending.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

THE KING'S CUP AIR RACE

[2865] Having read with interest your comments on the King's Cup Race, I would like to put a suggestion forward which I think would stimulate interest in the race when the machines have vanished over the trees.

Could it not be arranged for a machine, a very fast one for preference, fitted with a radio transmitter, to accompany the racing machines around the course? the operator to be in telephonic communication with the announcer, who would be enabled to give a running commentary of the progress of the race to the spectators on the aerodrome, which would relieve the monotony enormously; also the announcer's comments could be broadcast from the B.B.C.; suitable relays could be arranged to make this plan workable.

Everyone knows how interesting a B.B.C. Commentator can describe the Boat Race, for example, and if the King's Cup Race was followed round the entire course I think that it would be more exciting than even the Boat Race.

There are service machines suitably equipped, which I expect could be acquired for the day.

Kilburn, N.W.6.

July 13, 1933.

I.A.L. v. N.F.S.

[2866] I read with interest your editorial on the recent Imperial Airways v. National Flying Services case. As I was interested in that case and take an interest in aviation, I was sorry to see that that case had been so generally misunderstood.

The action was brought by Imperial Airways on two main grounds:—

(1) Breach of warranty. It was alleged that a warranty that the aerodrome at Hanworth was safe and suitable for the particular type of machine that N.F.S. had requested Imperial Airways to send, was to be implied from the correspondence between the two companies which constituted the agreement between them. Whether or not such a warranty could be rightly so implied was a question of law for the Judge and a matter on which no other evidence could be advanced.

(2) Negligence. This, of course, was a matter of fact for the jury after hearing the evidence and being directed as to the law by the Judge.

As a matter of convenience, the second point was taken first, and as the verdict of the jury was in favour of the plaintiffs, the question as to the implied warranty was never argued and therefore never decided.

The only point which emerges from the case which is of any interest is the Judge's direction as to the law of negligence in the particular circumstances of the case. The facts in this case were held to be covered by the well-known case of *Indermaur v. Dames*; that is, that the occupier of premises owes a duty to all persons coming on to those premises "in the way of business" [i.e., for the mutual benefit of himself and the occupier or of the occupier alone] to use reasonable care to prevent damage to such persons from any unusual danger of which the occupier knew or ought to have known. The occupier has the

alternative of making the premises safe or giving a warning. The questions which the Lord Chief Justice left to the jury illustrate this proposition. They were as follows:

(1) (a) Was the culvert dangerous? Answer: Yes. (b) Did N.F.S. know that it was dangerous? Answer: No. (c) Ought N.F.S. to have so known? Answer: Yes.

(2) Was the pilot negligent? Answer: No.

(3) If the pilot was negligent, might N.F.S., notwithstanding his negligence, still have avoided the accident by the exercise of reasonable care? Not answered.

The last two questions illustrate the defence of contributory negligence which the occupier can always plead.

Where no benefit accrues to the occupier or where the other person has paid for permission to land, different considerations will apply in each case, for the duty owed varies with the status of the person coming on to the premises—the smallest duty being owed to trespassers and the highest to persons who pay for their right of admission.

W. M. E. CRUMP.

Temple, E.C.

July 13, 1933.

LIVERPOOL AIRPORT

[2867] A copy of FLIGHT of July 6 has been sent to me, and I have read with interest the account of the opening of Liverpool Airport.

Would you mind my drawing your attention to a report of my speech, which is somewhat inaccurate? I did not say that I was antagonistic to the establishment of an airport, and was now converted. What I did say was that I was opposed to that particular portion of the Speke area being used for the aerodrome, as I wanted houses built on it. There was still sufficient ground for the aerodrome, but as the majority had decided the matter, I acquiesced. Perhaps you could see your way to correct the account, as you can appreciate the difference between the two statements as being important.

The Town Hall, Liverpool.

July 12, 1933.

ALFRED D. GATES.

Lord Mayor.

TRANSPORT CO-ORDINATION

[2868] Readers of Mr. Hall Caine's letter about the co-ordination between air and rail in Italy may be interested to know that there is similar co-operation between rail and road in that country.

A great number of Italian motor services operate with the definite object of feeding the railways: indeed, although Italy is covered with a network of road services, there is practically no competition with the railways. The motor services are usually timed to arrive and depart in connection with the trains and by combining rail and road services it is possible to reach remote villages; visitors to the mountain resorts in the Alps, Dolomites and Apennines find the coach services particularly useful.

W. STORMONT

(Maj. W. Stormont, F.R.G.S.),

London Manager, Italian State
Tourist Department (ENIT).

London, S.W.1.

June 19, 1933.

Lord Londonderry Entertains

THE Secretary of State for Air and the Marchioness of Londonderry entertained at luncheon yesterday (Monday) at Londonderry House, to meet the Air Council, certain delegates and representatives of the Dominions and India now in London who are specially interested in air matters. The following were present:—The Rt. Hon. R. B. Bennett, the Rt. Hon. G. W. Forbes and Mrs. Forbes, the Rt. Hon. S. M. Bruce and Mrs. Bruce, the Hon. R. Masters and Mrs. Masters, General the Rt. Hon. J. C. Smuts, the Hon. N. C. Havenga, the Hon. O. Pirow and Mrs. Pirow, Sir C. P. Ramaswami Aiyar, the Hon. G. Howard Ferguson and Mrs. Howard Ferguson, the Hon. Sir Thomas Wilford and Lady Wilford, the Hon. C. T. de Water and Mrs. de Water, the Hon. Sir Edgar Bowring, Sir Bhupendra N. Mitra, Colonel Sir Pierrie van Ryneveld

and Lady van Ryneveld, Lt.-Col. G. P. Vanier and Madame Vanier, Mr. F. G. Shedden, Lady Margaret Stewart, the Rt. Hon. Sir Philip A. G. D. Sassoon, Air Chief Marshal Sir Edward L. Ellington, Air Marshal Sir H. C. T. Dowding, Sir Christopher and Lady Bullock, Air Marshal Sir Robert and Lady Brooke-Popham, Air Vice-Marshal Sir Edgar and Lady Ludlow-Hewitt, Rear-Admiral A. Bromley, Mr. F. G. L. Bertram and Mr. L. G. S. Reynolds.

Propaganda by Air

A NAZI aeroplane coming from the direction of Munich is reported to have dropped leaflets over Salzburg on the afternoon of Friday, July 14. The Austrian Government state that in future Nazi propaganda aircraft will be met with armed resistance.

Yorkshire Trophy Race

from Heston to Sherburn-in-Elmet

1ST Mr. C. F. Gardner

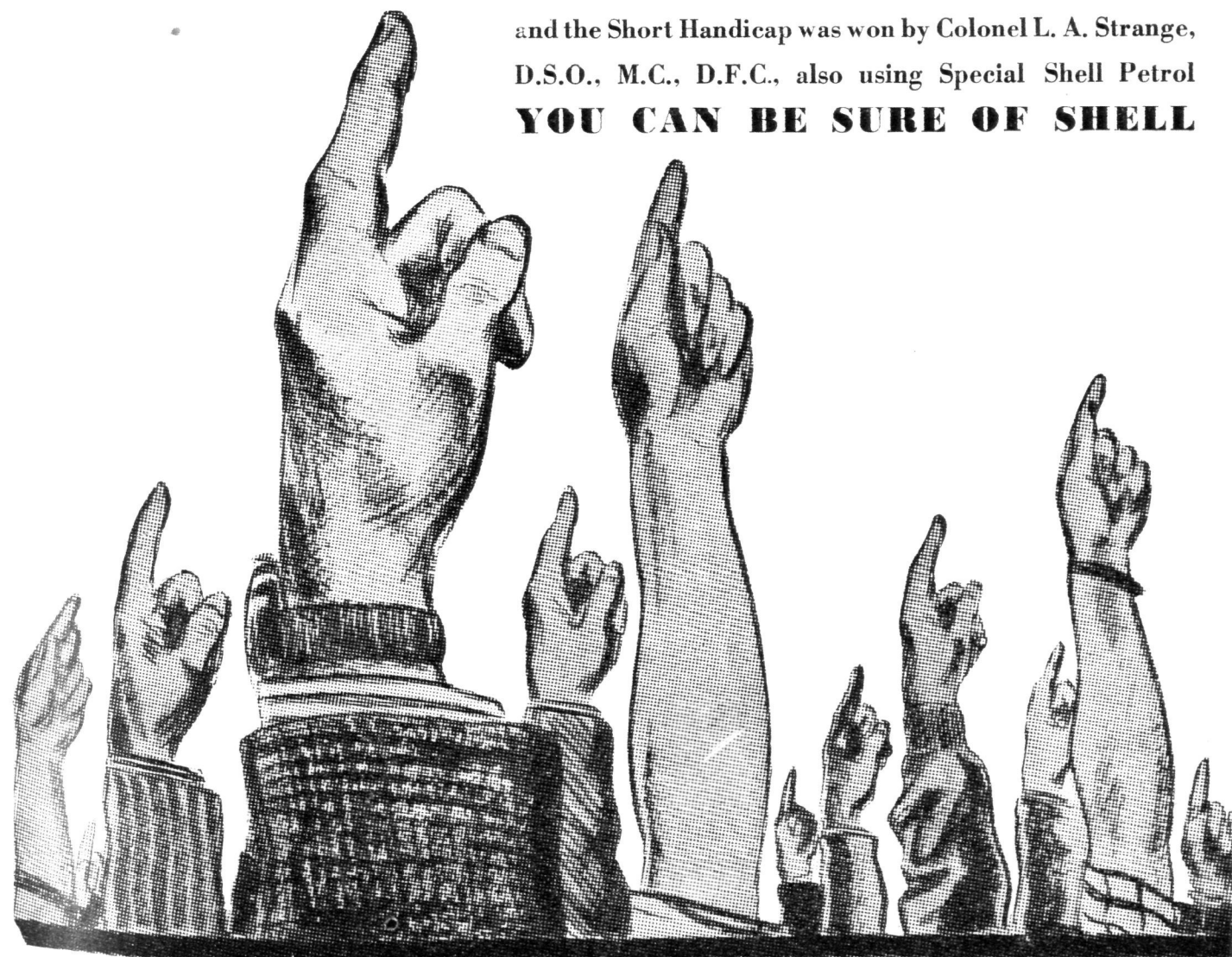
2ND Capt. Worrall

3RD Mr. Moody ——— using

**SPECIAL SHELL
PETROL**

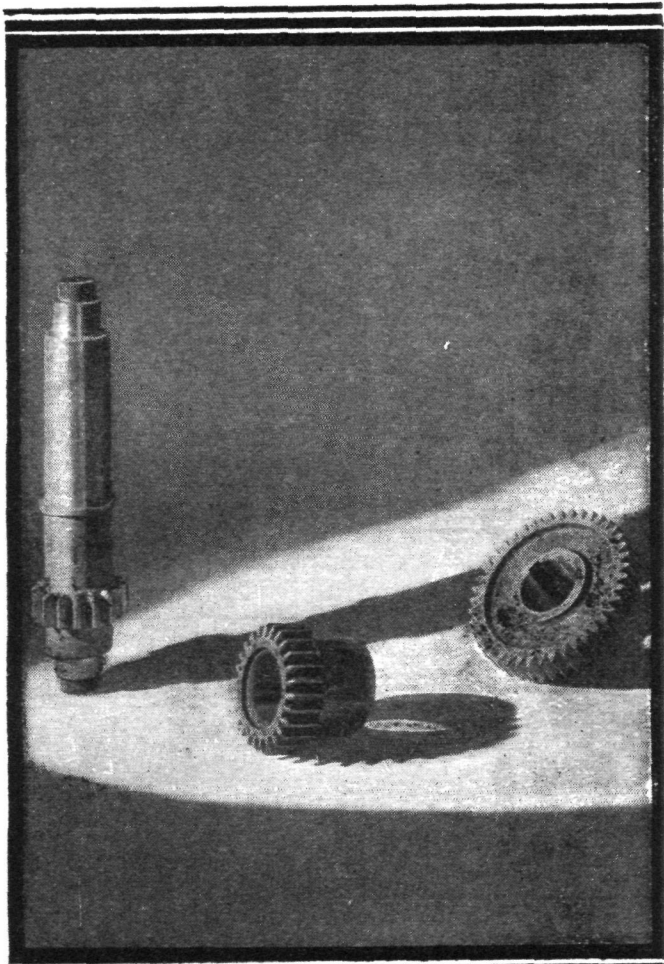
and the Short Handicap was won by Colonel L. A. Strange,
D.S.O., M.C., D.F.C., also using Special Shell Petrol

YOU CAN BE SURE OF SHELL



Save time by using the Air Mail.

Fast passenger vehicle parts made from "Hicore 90"—
courtesy of The Associated Equipment Co., Ltd.



'STOCKSBRIDGE' ALLOY STEELS

FOR HIGHLY STRESSED PARTS

Here are two of them:—

"**HICORE 90**"—a new alloy case-hardening steel with a core strength of 90 tons per square inch, permitting a thinner, well-supported case which will not chip.

"**MANCASE**"—a free-cutting case-hardening steel capable of a deeper case than carbon case-hardening steel, very suitable for machining on high-speed automatics.

Write for descriptive booklets of these and other "Stocksbridge" Steels. All alloy and special steels to BESA and other specifications are included in the "Stocksbridge" series.

SAMUEL FOX & CO. LTD.

THE UNITED Associated with The United Steel Companies Limited

STOCKSBRIDGE, SHEFFIELD

QF25

COMPANIES LTD

Over

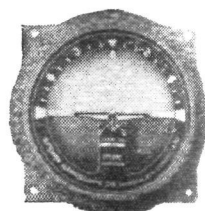
1,500 Aircraft

are fitted for

BLIND FLYING

with the

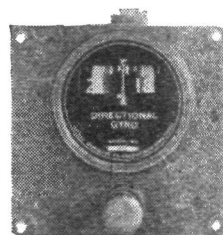
Sperry



HORIZON

and

DIRECTIONAL GYRO



Full particulars gladly
sent to anyone interested

THE SPERRY GYROSCOPE COMPANY, LTD.
GREAT WEST ROAD, BRENTFORD,
MIDDLESEX, LONDON.



IRVIN

THE PARACHUTE
FAVOURER BY
OVER

THIRTY-SIX GOVERNMENTS

ALL IRVIN TYPES ARE APPROVED
BY THE AIR MINISTRY.

Sole Distributors:
SELFRIDGES
(AVIATION DEPT.)

OXFORD ST.
Mayfair 1234.

HESTON
Hayes 410.

Kindly mention "Flight" when corresponding with advertisers.

ELECTRO-DEPOSITION OF METAL

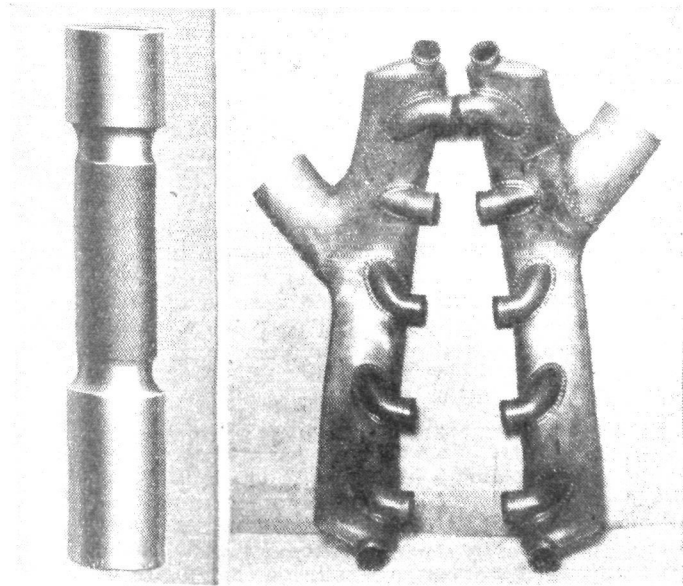
DEPOSITING metal on metal is generally classed in a wide and loose fashion as plating, but the degree of adhesion obtained by ordinary plating is a very different thing to that achieved by modern methods with selected metals.

Adhesion is of vital importance both for attaining a high resistance to corrosion and also for producing, on the article to be plated, a surface which will stand up to a large amount of wear.

A factory which has made an especial study of electro-deposition is Fescol, Ltd., of 101, Grosvenor Road, London, S.W.1.

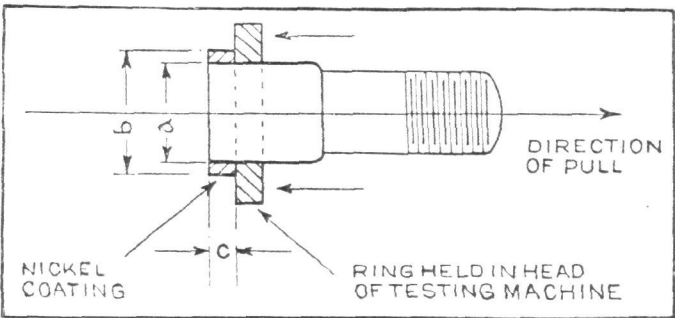
During a recent visit we saw a wide variety of aircraft components being coated with both nickel and chromium while in some cases cadmium is also used. Naturally, protection against corrosion is of paramount importance for both land and sea-planes, particularly as weight is kept at a minimum in aircraft construction by the use of thin gauge members of high tensile strength. Metal of thin gauge does not allow any margin for corrosion and so this enemy of the designers and manufacturers, to say nothing of the pilot and passengers, has to be combated by the surest methods known to science. The chief of these is the deposition, on parts which are subject to the corrosive action of the atmosphere or of agents like sea water, of a film of some chemically pure metal which will withstand that action. Chief among the metals used for this purpose are cadmium, nickel and chromium. In each case the anti-corrosive properties of the coating are dependent on the adhesion of that coating, and the following test carried out by the N.P.L. is illuminating in showing that a coating deposited by Fescol cannot possibly break away or peel off.

The specimens supplied for the tests consisted of three nickel-coated steel specimens and one solid steel specimen. The specimens were machined and then tested in direct tension as shown. It will be noted that the direct pull on the specimen is resisted by the adhesion between the annular layer of nickel and the steel core of the specimen. The solid steel specimen was of similar overall dimensions to the nickel-coated specimens. The tests were made in the 50-ton tensile-testing machine in use at the laboratory, and in each test the load was increased continuously until failure occurred at the large end of the specimen.



On the left is a plug gauge of the type used in most engineering works. When coated with chromium its wear is negligible. On the right is the exhaust manifold from an Armstrong-Siddeley aero engine. This is coated with nickel as an anti-corrosive measure.

New Air Armament for Japan
THE new building programme for the Japanese Navy includes two 10,000-ton aircraft-carriers and eight flying boat units. The aircraft-carrier *Hosho* will be scrapped.



Adhesion Test Piece

The results of the tests are given below and the maximum adhesive or shear stress applied was obtained in the following manner: Maximum adhesive or shear stress applied = $\frac{\text{Maximum load}}{W \times a \times c}$ where a = diameter of body as shown in Figure, and c = depth of head as shown in Figure.

NPL Eng. Dept. Test Mark.	Description of specimen.	Diameter "A" in.	Diameter "B" in.	Depth "C" in.	Failing load tons.	Maximum Adhesive or shear stress, applied, tons sq. in.
EQZ 1	Nickel Coated	1.034	1.17	0.250	14.96	18.4
EQZ 2	" "	1.035	1.17	0.250	16.17	19.9
EQZ 3	" "	1.030	1.17	0.250	15.98	19.8
EQZ 4	" Solid "	1.028	1.13	0.250	11.68	14.5

In the case of each of the nickel-coated specimens examination of the fracture showed that failure occurred by *shearing of the steel just inside the nickel-coating*, and not by failure of the adhesion between the coating and the steel. The failure of the solid specimen was similar to those of the nickel-coated specimens.

In aircraft, parts like exhaust manifolds and tail pipes are coated with nickel for many manufacturers, while small fittings of steel are cadmium coated. Bright finished chromium has not been used much for anti-corrosive purposes, it being more applicable to yacht and shop fittings. There is a use to which, however, it is peculiarly adaptable in a hard or non-bright form, and that is for the rebuilding or salvage of worn parts. Nickel is also used for the purpose, the choice of metal depending upon the function of the part to be built up. A great advantage of the process is that it is a cold one and that no distortion can therefore take place as it could do when welding is resorted to. Chromium as deposited by the Fescol process is exceedingly hard, thus entirely obviating wear in the case of parts like plug gauges and measuring gauges of other forms, while the surface obtained after grinding or lapping is so extremely smooth and slippery that journals of shafts which have been coated with chromium by this process will run perfectly well in badly lubricated bearings without either wear to the shaft or to the bearing.

Chromium as deposited can be machined to the finest limits and the Fescol Company have all facilities for carrying out work of this nature.

In aircraft engines satisfactory use has been made of the properties of chromium by having the working faces of rocker arms, camshafts, gudgeon pins, etc., coated; in all cases the life of the part so treated has greatly been increased.

There seems to be no end to the applications of the process, and we would suggest that, for aircraft purposes in particular, it would be well worth investigating the possibilities of depositing a hard bearing surface, like that of chromium, on one of the light alloys, say duralumin.

Gliding Over the Alps

HERR KRONFELD, on Saturday, July 15, successfully glided over the Alps. He hopes later to glide over the Apennines.

THE AIR EXERCISES

THE annual Air Exercises of the command Air Defence of Great Britain commenced at 6 p.m. on Monday, July 17, and may continue up to the morning of Friday, July 21. If operations are not delayed by weather, the exercises may be brought to an end sooner by the A.O.C.-in-C., Air Marshal Sir Robert Brooke-Popham, K.C.B., C.M.G., D.S.O., A.F.C. The object of the Exercises this year is to afford practice to the staffs and squadrons of the Fighting Area and the Wessex Bombing Area respectively to work together as units in conditions bearing some relation to active service. The Exercises will not be manœuvres in the proper sense of the word, and there will be no question of one side or the other winning the war. This year there will be no testing of the defences of London, and in fact London, Birmingham and all other large towns are outside the area of operations. In addition to the squadrons of the two Areas mentioned above, part of the Observers Corps were on duty from 6 p.m. to midnight on Monday, Tuesday and Wednesday. One searchlight unit, the 1st Anti-aircraft Searchlight Battalion, R.E., is taking part in the Exercises. This unit belongs to the regular Army. The Territorial units, who are an important part of the Air Defence scheme, are not being used, and there is no anti-aircraft artillery. To supplement its sources of information, the Fighting Area, which is defending Northland, has the use of detachments of two Cadre squadrons, No. 501 (City of Bristol) (Bomber) Squadron, which flies "Wallaces," and No. 504 (County of Nottingham) (Bomber) Squadron, which flies "Horsleys."

In order to make the Exercises interesting to those taking part in them, a General Idea has been drawn up. Northland is the country on the defensive, and is defended by 13 fighter squadrons and the other units mentioned above, under the command of Air Vice-Marshal F. W. Bowhill, C.M.G., D.S.O. The country of Northland consists of all England east of a line drawn through Lancaster, Birmingham, Swindon, Poole. East and north of Northland lies neutral territory, which must not be violated. Northland, however, is also partially protected by two strange and unexpected ranges of mountains which are too high to be crossed by anything short of the Houston-Everest machines. One of these ranges covers the London district, stretching through Waltham Abbey, Hornchurch, West Malling, Tunbridge Wells, Horsham, Hanworth Park, Harrow and round again to Waltham Abbey. The other range covers the whole of Norfolk and a good half of Suffolk, the boundaries being King's Lynn, Cromer, Aldeburgh, Cambridge, King's Lynn. Thus there are only two gaps through which hostile bombers can enter Northland, one between Horsham and Poole, and the other between Aldeburgh and Hornchurch.

Southland is the aggressive Power, and its war leader is Air Vice-Marshal Sir Tom Webb-Bowen, K.C.B., C.M.G., who has at his command nine day-bomber squadrons and seven night-bomber squadrons. The territory of Southland is even more surprising than the mountains of Northland, for the good people of Southland live entirely on lands which to the ordinary mortal appear to be the English Channel and the North Sea. In practice this means that though the bomber squadrons have to spend their time aground on aerodromes which are situated in Northland, they must go out to sea before they can commence a bomb raid. So is the stage set.

The champions on each side, in addition to the units mentioned above, are as follows:—

NORTHLAND			
Fighter Squadrons	Aircraft type	Station	Squadron Leader
No. 19	"Bulldog" ..	Duxford ..	A. C. Sanderson, D.F.C.
" 23	"Demon" ..	" ..	H. G. Crowe, M.C.
" 25	"Fury" ..	" ..	A. L. Paxton, D.F.C.
" 29	"Bulldog" ..	North Weald ..	H. D. O'Neill, A.F.C.
" 56	" ..	" ..	G. E. Wilson
" 54	" ..	Hornchurch ..	I. M. Rodney.
" 41	" ..	Northolt ..	J. A. Boret, M.C., A.F.C.
" 32	" ..	" ..	D. L. Blackford.
" 43	"Fury" ..	" ..	R. H. Hanmer, M.C.
" 3	"Bulldog" ..	Upavon ..	C. A. Stevens, M.C.
" 17	" ..	" ..	F. J. Vincent, D.F.C.
" 1	"Fury" ..	" ..	C. B. S. Spackman, D.F.C.
Reconnaissance aircraft			
No. 501	"Wallace" ..	Biggin Hill ..	—
B.S.			
No. 504	"Horsley" ..	" ..	C. T. Anderson, D.F.C.
B.S.			

SOUTHLAND			
Day Bombers	Aircraft type	Station	Squadron Leader
No. 12	"Hart" ..	Martlesham ..	D. F. Stevenson, D.S.O., M.C.
" 18	" ..	" ..	T. C. Luke, M.C.
" 57	" ..	" ..	F. W. Trott, O.B.E., M.C.
" 33	" ..	Hawkinge ..	R. A. George, M.C.
" 101	"Sidestrand" ..	" ..	Wing Cmdr. F. H. Coleman, D.S.O.
" 602	"Wapiti" ..	" ..	Sqd. Ldr. Lord Clydesdale, M.P.
" 35	"Gordon" ..	Tangmere ..	V. Buxton, O.B.E.
" 40	" ..	" ..	M. L. Taylor, A.F.C.
" 603	"Wapiti" ..	Manston ..	H. R. Murray-Philpison, M.P.
Night Bombers			
No. 7	"Virginia" ..	Worthy Down	Wing Cmdr. A. L. Gregory, M.B.E., M.C.
" 58	" ..	" ..	Wing Cmdr. L. L. MacLean.
" 9	" ..	Boscombe Down	" .. A. W. Mylne.
" 10	" ..	" ..	" .. H. K. Thorold, D.S.C., D.F.C., A.F.C.
" 99	"Hinaidi" ..	Manston ..	Wing Cmdr. E. D. Johnson, A.F.C.
" 502	"Virginia" ..	" ..	Wing Cmdr. L. T. N. Gould, M.C.
" 503	"Hyderabad" ..	Tangmere ..	" .. H. I. Hanmer, D.F.C.

The military objectives which are to be attacked by the Southland forces are Cardington, Wantage, Henley-on-Thames, Halton, Stratford-on-Avon, Warwick, Wittering, Bicester, and Hatfield. A camera obscura is placed at each military objective, and, as usual, the bombers will indicate that they are dropping bombs by visual signals. A proportion of the bombers will carry the full war load of dummy bombs. When the Observers Corps is not in action bombers will report their approximate position, height, and course by W/T at regular intervals.

One very excellent novelty has been introduced for these Exercises. In previous years the umpires have awarded casualties whenever a combat took place. These casualties had nothing to do with the actual tactics. It did not mean that so many fighters had got into good position under the tails of the bombers, or that the fighters had been so rash as to dive right into the muzzle of the gun in the back cockpit. A formula had been drawn up which took account of the numbers engaged on each side, the types and their performance and armament, and casualties were awarded accordingly. Sham fighting is always artificial, but this made it more artificial than it need have been. Moreover, false conclusions were apt to be drawn by adding up the casualties on each side, although no bomber dropped out of formation because he had been adjudged shot down, and therefore he might be shot down several times on one raid, and yet might also be given credit for having dropped his load of bombs on the target. This year no casualties are being awarded.

Bombing formations are allowed to make use of clouds, as they would do in war, but to minimise the danger of collisions the following precautions have been ordered. The A.O.C. Southland has been directed to arrange his raids so as to avoid congestion in the corridors between the mountain ranges and neutral country. The fighters are allowed to ascend and descend through clouds, but not to use them for tactical purposes when in contact with bombing formations. The operations are confined to an area between 2,000 and 16,000 feet, unless the Directing Staff directs otherwise.

Throughout the night the fighters have to show their navigation lights. The bombers have to show their lights except when crossing a limited area on the inward journey. But even then, if a bomber sees another aircraft approaching in such a way that a collision seems possible, the bomber must at once switch on the navigation lights. The responsibility for avoiding collision by night has been placed on the bombers.

The rules of combat have been drawn up as follows. When a day-bomber formation is attacked by fighters the bombers are to hold their course. If the two formations meet head on, the fighters are to give way in sufficient time to prevent the bombers from changing course. By night, too, if a bomber is attacked it is to hold its course. Of course night bombers work singly. So do fighters when patrolling by night, and on these Exercises not more than one fighter at a time is to attack a night bomber. In no circumstances are fighters to approach within 100 yards of the enemy. The same rule applies to the bombers, supposing that the fighters do not give way in time. The fighters are forbidden to attack or continue attacking any

bomber aircraft within three miles of any of the targets. Presumably this rule means that the authorities want the bombers to be undisturbed while taking aim at the target. They have a fair amount to do at that critical moment, for they have not merely to signal the dropping of the bombs, but they have to make sure that the camera obscura is paying attention to their proceedings and has received their signals of identity, height, etc. It might be rather distracting to have a "Bulldog" diving at one at such a busy time.

It appears that the bombers are to be practised in finding their way to a target and taking aim at it, and they are not really concerned at all with the doings of the fighters, though doubtless the gunners will get their guns on to the fighters and go through the motions of shooting them down. In the great war, anything over 100 yards was considered a long shot in the air, and few men were likely to score a hit at such a range. The object of the fighters is merely to intercept. Once they have launched their attack there must be no question of fighting it out. The Observers Corps, so far as it is in action, will get good practice and, when the weather is not too bad, will have a very interesting time. Perhaps the most important part of the Exercises will be the practice which the various staffs will get in conducting operations, and the Fighting Area in particular will have to make the best use of all the information which it gets, and to act very quickly on that information. The whole scheme of air defence depends on rapid information and communications more than on anything else. It is certainly necessary to practise everyone in these points at least once a year.

On Monday evening a bank of low clouds was reported to be moving slowly in from the south-west of England, and they were expected to cover the hill tops. None the less, soon after 6 p.m., the Observers' posts reported nine raids coming in through the corridors. The fighter squadrons were soon up on patrol. Two of the raids did not reach their objectives, but of the other seven, five

squadrons got in and out without being molested. No. 35 (Bomber) Squadron was attacked three times. The Auxiliary Squadron from Glasgow, No. 602, led by Lord Clydesdale, was intercepted by No. 23 (Fighter) Squadron over Marlow. It is interesting to speculate whether the "Wapitis" would have been able to hold their own against the attack of the "Demons."

Then night came on, and so did the cloud bank. Nevertheless six night bombers set out one by one, four "Hinaidis" from No. 99 B.S. at Manston and two "Virginias" of No. 502 (Ulster) (Bomber) Squadron from the same aerodrome. But the weather got worse, and it soon was realised that they could not reach their objectives, so they were recalled by wireless, and the night operations thus came to an end with no blood spilt.

Dawn revealed low clouds covering the whole area of the operations, and in many cases right down to the surface of the ground. Nevertheless No. 12 (Bomber) Squadron did a fine piece of work by making two successive raids. One can always count on No. 12 B.S. to make the most of any circumstances. Nos. 33, 101, and 602 also made raids, but all had to fight their way in. Doubtless the communications were getting into smoother working order than on the previous night. One of the reconnaissance squadrons reported No. 33 B.S. over Maidstone. Another interesting incident is reported. The "Sidestrands" of No. 101 B.S. were to attack Halton, which lies high on the western slope of the Chiltern hills, and probably the clouds came down very low over this objective. No. 101 got there, but was so low above the ground that it was not possible to drop bombs, the machines might have suffered themselves from the blast of the explosion. The bombs are imaginary, but the squadrons have to act as if they were real ones.

The weather showed signs of improvement during the day, though there remained a possibility of low clouds over the coast.



THE ROYAL AIR FORCE

London Gazette, July 11, 1933.

General Duties Branch

The undermentioned Pilot Officers are promoted to the rank of Flying Officer (June 19):—L. N. Elsner, A. W. Geoghegan, M. B. Hamilton, R. H. A. Leigh, F. H. Tyson, J. N. H. Whitworth, M. F. D. Williams. *Gazette* May 2, concerning Wing Commander Vivian Gaskell-Blackburn, D.S.C., A.F.C., is cancelled. F/O. G. B. Musson is transferred to Reserve, Class A, April 28, 1933. (Substituted for *Gazette*, May 9.) The short-service commns. of the undermentioned Acting Pilot Officers on probation are terminated on cessation of duty (July 5):—E. C. Clark, G. A. Kelly.

Stores Branch

Flt.-Lt. G. J. Maygothling is placed on retired list (July 7).

Medical Branch

Sqdn.-Ldr. (Quartermaster) W. P. Conolly is placed on retired list (July 12).

Dental Branch

F/O. R. Scoggins, L.D.S., is promoted to the rank of Flt. Lt. (July 6).

Memoranda

179028 Cadet B. G. H. Cox is granted an hon. commn. as a Sec. Lt. with effect from the date of demobilisation. The permission granted to Sec. Lt. G. W. Yallop to retain his rank is withdrawn on his enlistment in the Territorial Army.

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The undermentioned are granted commns. as Pilot Officers on probation in Class AA (i):—C. A. Penberthy (June 16); A. Reid (June 28).

The undermentioned are granted commns. as Pilot Officers on probation in Class AA (ii):—R. H. Adams, K. G. Beauchamp, N. C. Beck, P. H. Macmillan, K. W. McQueen, W. L. M. Merrett, H. Perring, B. C. R. Powell, J. E. D. Scott, T. C. M. Wigg (June 26); G. M. Adams (June 27); F. H. Vivian (July 1).

Flt.-Lt. C. Clarkson is transferred from Class A to Class C (June 30). F/O. A. G. P. Way is transferred from Class C to Class AA (ii) (July 2). F/O. A. N. Francombe relinquishes his commn. on completion of service (March 15).

Medical Branch

F/O. G. Williams, M.R.C.S., L.R.C.P., relinquishes his common. on completion of service (June 15).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodore J. B. Bowen, O.B.E., to Air Ministry, Dept. of C.A.S. (D.O.S.D.), 3.7.33, for duty as Head of Signals Branch, *vice* A/Cdre. A. D. Warrington-Morris, C.M.G., O.B.E.

Wing Commander F. Sowrey, D.S.O., M.C., A.F.C., to R.A.F. Depot, Uxbridge, 12.6.33, to Command *vice* G/Capt. F. L. Robinson, D.S.O., M.C., D.F.C., A.D.C.

Squadron Leader T. O. Clogstoun, to H.M.S. *Courageous*, 7.7.33, for Engineer duties, *vice* Flt. Lt. F. H. Whitmore, M.B.E., D.S.C.

Flight Lieutenants: J. D. Breakey, D.F.C., to No. 7 (B) Sqdn., Worthy Down, 3.7.33. T. S. Horry, D.F.C., A.F.C., to Station H.Q., Duxford, 4.7.33. D. F. Anderson, D.F.C., A.F.C., to No. 22 (B) Sqdn., Martlesham Heath, 6.7.33. E. D. Barnes, A.F.C., to Central Flying School, Wittering, 7.7.33. D. J. Waghorn, to Central Flying School, Wittering, 5.7.33. A. Allen, to Aeroplane and Armament Experimental Estab., Martlesham Heath, 3.7.33. G. I. L. Saye, A.F.C., to R.A.F. Base, Calshot, 4.6.33. K. E. Ward, to No. 9 (B) Sqdn., Boscombe Down, 3.7.33.

Flying Officers: W. T. F. Wightman, to R.A.F. College, Cranwell, 11.6.33. E. C. Bates, to Station Flight, Abingdon, 19.6.33. R. Cleland, to No. 3 Flying Training School, Grantham, 10.6.33. G. B. Keily, to R.A.F. College, Cranwell, 10.6.33. W. M. L. MacDonald, to No. 3 Flying Training School, Grantham, 10.6.33. M. V. Ridgeway, to No. 24 (Commn.) Sqdn., Northolt, 21.6.33. N. C. Singer, to No. 607 (Co. of Durham) (B) Sqdn., Usworth, 10.6.33. F. A. Wardell, to No. 3 Flying Training School, Grantham, 10.6.33. H. R. Dale, to No. 45 (B) Sqdn., Helwan, Egypt, 21.6.33.

Stores Branch

Flying Officer P. Dennehy, to No. 26 (A.C.) Sqdn., Catterick, 26.6.33.

Medical Branch

Squadron Leaders: P. A. Hall, to Princess Mary's R.A.F. Hospital, Halton, 1.7.33, for duty as Med. Officer. T. McClurkin, to H.Q., Inland Area, Stanmore, 1.7.33, for duty as Deputy Principal Med. Officer (Hygiene).

Flight Lieutenants: C. W. Coffey, to R.A.F. Base, Calshot, 3.7.33. B. W. Cross to H.Q., Air Defence of Gt. Britain, Uxbridge, 1.7.33. J. Kemp, to H.Q., No. 21 Group, West Drayton, 3.7.33.

R.A.F. COLLEGE, CRANWELL

The following are extracts from the Report of Air Cdre. W. G. S. Mitchell, C.B.E., D.S.O., M.C., A.F.C., Commandant of the Royal Air Force College, Cranwell, at the Passing-out Inspection of Flight Cadets, July, 1933. The inspection was carried out by Air Marshal Sir R. Brooke-Popham, K.C.B., C.M.G., D.S.O., A.F.C.

The present strength of the College is 121 Flight Cadets.

Conduct and discipline of the Cadet Wing during the present term has been generally good.

FLYING TRAINING

(a) *General*.—Thirty-three Cadets of the IV term have completed their flying training. Thirteen have qualified for Single-Seater Fighters, and 20 have qualified for Bomber, Army Co-operation and Flying Boat Units.

The R. M. Groves Memorial Flying Prize was won on a Hart aircraft by Flight Cadet A. M. Engineer, who is one of the Indians undergoing training at the College for the Indian Air Force.

The Instrument Flying course has been done by all cadets of the IV term, the average time being 8 hours.

During this term one cadet has been withdrawn on account of inability to become a safe pilot. A second cadet applied to withdraw in the first few days of the term, and two others were withdrawn owing to incurable air sickness.

In English Literature and General History the term now passing out have not, as a whole, reached the usual standard of knowledge and criticism, and cadets are urged to continue their studies by private reading.

Cadets of the IV and III terms have passed out in Air Pilotage on service types. The IV term are well practised in cross-country flying, and the III term are, on the whole, well advanced in this training.

The progress of the interior of the New College Building has been rapid recently and all arrangements are being made for the occupation at the beginning of next term.

The new Cadets' Instructional Workshop is progressing well.

The standard of Physical Training is good. The average physical improvement of the passing-out term is height increase 0.41 in., weight increase 7.1 lb., and chest expansion 1.06 in.

The standard of Fencing was higher than in the previous year. The match against R.M.A. was very closely contested, a decision not being arrived at until the very last hit of 27 fights. Four cadets were entered at the Royal Tournament and reached their final pools.

The standard of Athletics was satisfactory. Great difficulty was experienced in building up a team, very few of the old Colours being available, and there being very little talent in the first year.

In the Triangular Contest, Sandhurst were first with 68½ points, Woolwich second with 63 points, and the College third with 57½ points.

It has been decided this year to alter the conditions governing the award of the "Victor Ludorum" Cup for the Inter-Squadron Athletic Competition. The Cup is now given to the Flight Cadet obtaining the highest number of points for the College in outside athletic matches. This year the Cup was gained by the Captain of Athletics, Flight Cadet Sergeant D. Finlay.

Since the last report, the Beagles have hunted on 22 days, providing sport and exercise to good fields of cadets and local residents.

The average number of cadets attending meets was about 20.

(a) The Sword of Honour, presented to the best all-round Flight Cadet in the senior term has been awarded to Flight Cadet Under-Officer John Vincent Clarence Badger.

(b) The prize awarded to the Flight Cadet in the senior term obtaining the highest marks in Humanistic Subjects has been awarded to Flight Cadet Corporal Bernard Horace Becker.

(c) The prize awarded to the Flight Cadet in the senior term obtaining the highest marks in Aeronautical Engineering has been awarded to Flight Cadet Corporal Bernard Horace Becker.

(d) The Abdy Gerrard Fellowes Memorial Prize, for the Flight Cadet obtaining the highest marks in Mathematics and Science, has been awarded to Flight Cadet Corporal Bernard Horace Becker.

(e) The J. A. Chance Memorial Prize, awarded to the Flight Cadet in the senior term obtaining the highest marks in Service Subjects has been awarded to Flight Cadet Corporal Reginald Ruchet Fairweather.

(f) The R. M. Groves Memorial Prize, for the best all-round pilot in the senior term, has been awarded to Flight Cadet Aspy Merwan Engineer.

BRIEFLY

All the 24 Italian flying-boats which recently flew from Rome to Chicago were equipped with Huson Aperiodic Compasses, and the fuel used was Stanavo Aviation.

Very clear and effective broadcasting equipment for the Herts and Essex Aero Club's Meeting at Broxbourne was installed by Film Industries, Ltd., 60, Paddington Street, London, W.1.

Wiley Post's Lockheed "Vega" Winnie Mae, in which he is attempting a round-the-world flight, is fitted with the latest type of "robot pilot" produced by Sperry Gyroscope, Ltd.

Five "Moths" and two Desoutters which were the property of National Flying Services, Ltd., have now been registered in the name of Col. the Master of Sempill.

Completion of the Ugo Antoni variable camber wing is foreshadowed by the registration of a Breda 15, G-ABCC, to the Gloster Aircraft Co., Ltd.; this wing was described in FLIGHT for May 27, 1932.

Two "Moths" of wooden construction with "Gipsy III" engines have been acquired by the Scottish Flying Club, at Renfrew.

The Comper "Swift" ("Gipsy III"), G-ABWH, flown by Mr. W. L. Hope in the King's Cup Race, and the "Monocoupe," G-ABBR, originally owned by Lord Carberry, have both been sold abroad.

It is hoped to have a sufficiently large area of the site chosen for the Hastings Airport cleared as a landing ground fit to use for the forthcoming display there by Sir Alan Cobham's National Aviation Day.

Mr. E. C. Gordon England has been appointed to the Board of Directors of the Vacuum Oil Co., Ltd. Mr. England joined the company on September 1, 1930, as Manager of the Automotive Department and is well known to our readers as one of the pioneers of aviation. He has recently been appointed a member of the Independent Committee "to consider the regulations at present governing private flying."

"Links," the journal of Alexander Duckham & Co., Ltd., draws, in its July issue, attention to the fact that July 25 is the twenty-third anniversary of M. Blériot's Channel crossing by air. Mr. A. Duckham commemorated that achievement by laying down a granite replica of a monoplane on the spot above Dover where Blériot landed.

We have often drawn attention to those ideal tenders to an aircraft—M.G. Cars. Their consistent successes in races have won for them a unique position among the

lighter sporting cars. Now they are trying a new scheme for racing which is really following out the practice of our fighting aircraft. The three Magna's racing at Brooklands next Saturday are to be fitted with Philco Radio receivers so that orders may be transmitted to them from the pit during the progress of the race.

Maj.-Gen. the Rt. Hon. J. E. B. Seely, Chairman of the Air League of the British Empire since 1932, who became a Baron in the King's last Birthday Honours list, has taken the title of Lord Mottistone.

IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912. For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on, yearly, the figures for 1932 being given in FLIGHT, January 19, 1933.

	Imports		Exports		Re-exports	
	1932.	1933.	1932.	1933.	1932.	1933.
Jan. ..	2,456	2,073	122,942	82,963	863	827
Feb. ..	2,503	9,866	181,482	79,357	90	3,050
Mar. ..	1,946	3,760	167,195	126,008	200	821
April. .	622	2,236	142,145	121,030	1,128	94
May ..	1,747	232	138,356	149,214	5	—
June ..	398	1,021	126,330	137,186	125	2,037
	9,672	19,213	878,450	688,737	2,411	6,829

PUBLICATIONS RECEIVED

The Roadway Official Motor Coach and Air Services Time Table. No. 27. Summer Edition, 1933. Roadway Publications, Polebrook House, Golden Square, London, W.1. Price 6d.
 Patents and Trade Marks. By Benj. T. King, C.I.M.E. King's Patent Agency, Ltd., 146A, Queen Victoria Street, London, E.C.4.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1932

Published July 20, 1933

- 614. P. TROJANI. Propellers of helicopters. (394,402.)
- 1,991. SPERRY GYROSCOPE Co., Inc. Air-driven gyroscopes. (394,412.)
- 9,250. A. T. S. Co., Ltd. and B. L. MARTIN. Control surfaces of aircraft. (394,452.)
- 25,702. G. P. DEVANEY. Two-stroke-cycle i.c. engines. (394,519.)
- 26,804. H. H. W. H. SMITH (trading as H. H. SMITH & Co.). Screw propellers. (394,527.)
- 34,195. SOC. ANON. ALFA ROMEO. Manufacture of airscrews. (394,584.)

Personals

PREPAID

(18 words or less 3/6, then 2d. per word).

To be Married.

TANNER : INNES.—The engagement is announced between FLYING-OFFICER E. A. H. TANNER, Royal Air Force, of Dunedin, New Zealand, and JOAN HELEN, elder daughter of the late John Alfred Innes and Mrs. C. W. P. Hodsoll, of Pleystowe, Capel, Surrey.

Married.

FLEMING : STEIL.—On July 12, 1933, at St. Michael's Church, Chester Square, S.W.1, by Wing-Com. the Rev. Maurice Edwards, assisted by Canon Elliott, ROBERT FRANCIS FLEMING, R.A.F., to RONA, only daughter of Sqd.-Ldr. and Mrs. Steil.

Birth.

PAUL.—On July 13, 1933, at Hereford, to MOLLY (née Appleton), wife of CHRISTOPHER PAUL, R.A.F.—a daughter.

Deaths.

USSHER.—On July 5, 1933, killed in aeroplane accident in East Africa, RICHARD USSHER, of Laburra, Kenya Colony, only son of the late Capt. Edward Usher, Scots Greys, and Mrs. Edward Usher, of 11, Wyndham Place, London.

USSHER.—On July 5, 1933, killed in aeroplane accident in East Africa, ETHEL, wife of RICHARD USSHER, Laburra, Kenya Colony, and daughter of Colonel and Mrs. Hopley, of Nairobi, Kenya Colony.

MISCELLANEOUS ADVERTISEMENTS.

Advertisements for this column should arrive at this office by **Monday, 12 o'clock noon.**

Special PREPAID Rates:—

18 WORDS or less, 3/6, then 2d. per word

Display Caps Throughout, 1/6 per line.

Personal Notices, Minimum 3/6, then 2d. per word.

Situations Wanted ONLY, 18 words, 1/6.

1d. per word after.

Box No., 1/- per insertion extra.

PATENTS

STANLEY, POPPLEWELL & FRANCIS, Chartered Patent Agents, 88-90, Chancery Lane, London, W.C.2. Telephone: Holborn 6393. Established 1879.

F. J. CLEVELAND & CO., Chartered Patent Agents, 29, Southampton Buildings, London, W.C.2. Telephone: Holborn 5875-6.

KING'S PATENT AGENCY, LTD., 146A, Queen Victoria Street, E.C.4.—"Advice Handbook" and consultations free. 47 years' references. Phone: Central 0682.

A. MATHISEN, B.Sc. Aeronautical Invention Patents, Working Drawings, Exploitation Advice. First Avenue House, High Holborn, W.C.1.

GEE & CO., 51, Chancery Lane, London, W.C.2. Ask for Book on "Patents, Trade Marks," etc.

INSURANCE

COMPREHENSIVE or Public Liability Competitive Premiums, also Personal Accident.—Full particulars by return, from DEFENCE LIMITED, Aviation Department, 40, King William Street, London, E.C.4. Tel.: Mansion House 9944. 7-13

SOUTH DOWNS AERO CLUB AT FORD near Bognor.

Excellent aerodrome and hangars, attractive club house, no landing fees. Flying at 50/- per hour. Bathing, tennis, yachting, golf—all within easy reach.

INTERNATIONAL Air Rally & Race LYMPNE AIRPORT, KENT 22nd & 23rd July

Display Including
No. 25 (F) SQUADRON R.A.F.
IN
TIED-TOGETHER AEROBATICS
Gates open 12 noon each day.
Arrival Competition between 12 noon
and 12.30 Saturday.

BRITISH SCHOOL OF FLYING

Gentlemen required to train for Flying... highly paid posts when qualified. Apply to the Principal.

19, Devereux Court, W.C.2. Telephone: Central 7760

CHEAPER RATES

30/- DUAL **20/- SOLO**
per hour

Universal Aircraft Services Ltd., Witney Aerodrome, Oxon.
Phone: Witney 110.

AIR TAXIS

AIR TAXIS, LTD., Stag Lane, Aerodrome Edgware. Phone: Edgware 0234/5. z

TUITION

THE INTERNATIONAL CORRESPONDENCE SCHOOLS offer sound instruction in **Aeroplane Design**, Fitting and Rigging, and Aero-Engine Fitting and Rigging; also expert training for Ground Engineers (Categories A, B, C and D). All instruction is by correspondence. Write to-day for our "Aeronautical Engineering" Booklet.—**INTERNATIONAL CORRESPONDENCE SCHOOLS, LTD.,** Dept. 182, International Buildings, Kingsway, London, W.C.2. 3-26

IMPORTANT.

MANY QUALIFIED "B" Licence Pilots can obtain Positions in the future if they hold the Air Ministry's Wireless Licence. Pilots who intend taking up Flying as a career should first train for the Air Wireless Licence.

The recognised Training Centre, with all the necessary equipment, is **THE LONDON TELEGRAPH TRAINING COLLEGE LIMITED** (Founded 1896), of 20, Penryn Road, Earl's Court, London. Telephone, FLAXman 8721. 6-13

R.A.F. AIRCRAFT Apprentices Examinations. Coaching by Graduate R.A.F., late Directorate of Technical Development, Air Ministry and Lecturer Govt. Training Departments.—Box No. 4116, c/o FLIGHT, 36, Great Queen Street, Kingsway, London, W.C.2.

AIRCRAFT CAMERAS

"EAGLE" AIRCRAFT CAMERAS and equipment for survey photography and Naval and Military requirements. Specialists in Air Photographic Apparatus. Hand Held Cameras.—Pistol Cameras for air snapshots. Full particulars from Manufacturers and Patentees.—**WILLIAMSON MANUFACTURING CO., LTD.,** Litchfield Gardens, Willesden Green, London, N.W.10. Phone: Willesden 0073-4. Contractors to Air Ministry, Admiralty, War Office, Colonial and Foreign Governments. z

AERIAL PHOTOGRAPHERS

AEROFILMS, LTD. Air Surveys—Aerial Photos taken of Factories, Estates, Aircraft in Flight, etc. Library of 35,000 Air Views.—Bush House, Aldwych, W.C.2. Telephones: Temple Bar 2164, 2165; and Showroom at Heston Airport.

AIR SURVEY

AIR SURVEY CO., LTD., Hayes, Middlesex, Telephone: 632 Hayes, Mdix. India Branch. Dum Dum, Calcutta. z

HOTELS

THE GRANGE, Woodley, close Sonning Golf Club, Reading Aerodrome, N.F.S. Flying School, and River, has vacancies. Moderate terms. 4-6

DUBARRY RESTAURANT

3 COURSE lunch 2s., 4 Course dinner 2s. 6d., and à la carte. Morning coffee. Afternoon teas.—214, Piccadilly (opposite Swan & Edgar). Phone: Regent 2640.

MAGNETOS

THE EUSTON IGNITION CO., LTD.

OFFICIALLY approved by the Air Ministry for Aircraft Magneto repairs. B.T.H. Service magnetos and spares in stock for immediate release. London: 329, Euston Road, N.W.1. Tel.: Museum 9921. Telegrams: Eusigco, Eusroad. London. Leeds: 117, Park Lane. Tel.: Leeds 26241. Westcliff: 671, London Road. Tel.: Southend 3491. 4-13

MALLITE AND APPCO PLYWOOD

SPECIAL ATTENTION
TO
DECORATIVE CABINS

RELIABLE FOR
AERO and SEAPLANES

USED BY THE LEADING AIRCRAFT MANUFACTURERS
THROUGHOUT THE WORLD

MANUFACTURED TO THE BRITISH AIR MINISTRY SPECIFICATION 4.V.3 BY

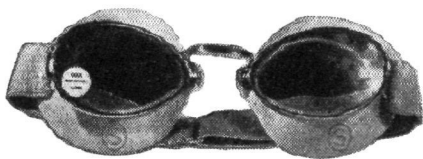
The AERONAUTICAL & PANEL PLYWOOD CO. LTD., 218-226, Kingsland Rd., LONDON, E.2.

TELEPHONE
BISHOPSGATE
5641
(4 lines)

TELEGRAMS
VICPLY
BETH
LONDON

CLOTHING

S. LEWIS'S famous High Speed Racing or Flying Goggles, large rubber cups, safety lenses, 30/- per pair.



A PERFECT GOGGLE.

White Zip Flying Suits, 22/-, 25/-, 27/6. Flying Helmets to match, 9/6. In Best Quality Leather Rubber Phone Pads, 15/-. Phone D.H. 9/-; cheaper pattern, 6/-. Featherweight Goggles, Triplex Lenses, 5/6, 6/6, 7/6. Leather Flying Jackets, Zip, 37/6, 45/-, 50 Luxor Goggles, No. 10, 50/-; No. 4, 40/-; No. 6, 77/6.

Discounts to Club Members and Air Force Pilots No connection with any other Firm.

Contractors to Colonial and Foreign Governments.

TRADE SUPPLIED.

S. LEWIS'S

Flying, Racing and Motor Clothing Fame,
27, Carburton Street, London, W.1.
Museum 4793.

WAINWRIGHT'S FLYING HELMETS

Air Ministry Pattern, Lined Chamois, Sorbo Padded Earphone Pouches, 18/6. Earphones, 7s. 6d. Triplex Goggles, 4/6. Special offer: Complete set, comprising Helmet, Earphones and Goggles, as above, 27/6.

SUMMER EQUIPMENT.

White or Fawn Drill Flying Helmets, Sorbo padded earphone pouches, 7/6 and 9/6. White Flying Suits, full length Zip fasteners, 25/-. Black or Tan Leather Jackets, knitted collar, cuffs and waist, lined silk, full length Zip fastener, 37/6.

AIR-TIGHT RACING GOGGLES.

Rubber-rimmed eyepieces, curved lenses, adjustable nosepieces, 6/6; Triplex lenses, 12/6; Ditto Triplex with large moulded rubber cups, 21/-. R.A.F. pattern lightweight with rubber-rimmed eyepieces, unsplinterable lenses, 6/6.

10% Discount to R.A.F. and Club Members.

**WAINWRIGHT, 300-302, EUSTON ROAD,
LONDON, N.W.1.**
Telephone: Museum 6280.

AERONAUTICAL ENGINEERING

AERONAUTICAL ENGINEERING TRAINING providing complete practical Works and Aerodrome experience for administrative side of Civil and Commercial Aviation. Students accepted in first instance for probationary term only. Day and Residential

Syllabus from

**THE COLLEGE OF AERONAUTICAL ENGINEERING
Chelsea, S.W.3.**

FIVE FIRST PLACES.

A REMARKABLE ACHIEVEMENT.

At the Associate Membership Examination of The Royal Aeronautical Society, held in December, 1932, students of The T.I.G.B. gained FIVE FIRST PLACES in their respective subjects, and also FIRST PLACE in the whole Exam.

The T.I.G.B. is the only Institution of its kind approved by The Society.

Write to-day for "The Engineer's Guide to Success"—144 pages—Free—which gives full particulars of The T.I.G.B. Courses in Aeronautics, contains the widest choice of engineering courses in the world, and shows you how to qualify for A.F.R.Ae.S., Air Ministry Licences, A.M.I.Mech.E., A.M.I.E.E., etc. The T.I.G.B. guarantees training until successful.

**THE TECHNOLOGICAL INSTITUTE OF
GREAT BRITAIN,**

37, Temple Bar House, London, E.C.4.
(Founded 1917. 19,000 Successes.)

INSTRUMENTS

COURSE and Distance Calculators, Drift Indicators, Bearing and Steering Compasses, Chart Instruments, Goggles.—From J. H. STEWARD, Ltd. 406, Strand, London. Estab. 1852.

"AIRCRAFT."

Official Journal of the Australian Aero Club.

1/- MONTHLY. FINE NUMBER NOW READY,
1/1½ post free.—Flight Office, 36, Great Queen
Street, Kingsway, London, W.C.2.

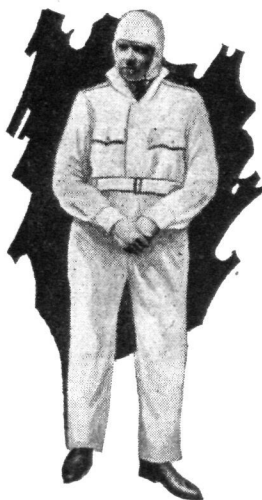
D. LEWIS LTD.

10 per cent. Discount allowed to
R.A.F. Officers and
Club Members.

WHITE
OR
KHAKI
FLYING
SUITS,

Zip
Fasteners,
25/- & 30/-

Button
Fronts
(white only)
21/-



FLYING HELMETS, White or Khaki Drill, 6/6, 8/6 & 10/6. Air Ministry pattern, Best Chrome Leather, Black or Tan, chamois lined, sorbo padded phone pockets ... 15/- & 22/6
EARRHONES, flat type, chromium plated ... 7/6
GOGGLES, triplex, with sponge rubber pads, 7/6, 15/- & 25/-
LUXOR GOGGLES, flat Triplex 40/- & 50/-
Ditto, with large curved lenses ... 77/6
LEATHER COATS, R.A.F. pattern, chrome leather, fleece lined ... 135/-
Slightly soiled ... 63/-
COMBINATION FLYING SUITS, fur collar, 60/-; also models with Zip fasteners.
SHEEPSKIN FLYING BOOTS, lambswool lined, with Zip fastener ... 47/6
Thigh high ... 84/-
SUEDE or LEATHER JACKETS, full length, open-ended Zip ... 37/6

WRITE FOR FULLY ILLUSTRATED
CATALOGUE POST FREE.

(No discount allowed on Luxor Goggles.)

ACTUAL MANUFACTURERS. TRADE
SUPPLIED—WRITE FOR QUOTATIONS.

D. LEWIS, LTD.

(Dept. F.)

124, GT. PORTLAND ST.
LONDON, W.1.

Tel. Museum 4314. Tel. Aviaqht, Wesdo, London.

Sole Agents for Belgium and Northern France:
Societa "Aera," Aerodrome der Deurne, Antwerp.
Sole Agents for Holland and the Dutch Colonies:
E. PELGER, Prinsestrat 33 & 35, Den Haag.



**Flotation Gear,
Balloons,
Pilot Harness,
Pneumatic Dinghys
Parachutes**

**Rope, Wire, Canvas and
Fabric Work**

17, STOKE ROAD,
GUILDFORD, SURREY

LIBERTY ENGINE

DYNAMOS 6v. 15 amps., reduction gear box attachment, Price 5s. carr. fwd. Coley Thermometers, Aircraft Instruments, and AVRO 504K. Spares, etc.

COLEY & ATKINSON, LTD.

ORDNANCE WORKS, KINGSTON - ON - THAMES.

MACHINES & ENGINES FOR SALE

HENLYS

We have available a few of the latest type

£395 SPARTAN ARROWS. Triplex 3-piece windscreen in pilot's seat. Full cockpit, including cockpit covers and dual control.

These machines can either be fitted with Hermes II or Gipsy II engines entirely rebuilt by the engine manufacturers.

12 months' C. of A. Cruising speed, 90 m.p.h. Large luggage locker with extension to carry golf clubs. Very quick take-off, ideal for landing in small fields.

Trial flights available at Heston or any other aerodrome by appointment. Write for list of second-hand machines and particulars of our Hire and Fly Yourself plan.

Exchanges and deferred terms.

Heston Air Port, Middlesex. Phone: Hayes 410.

Woodford Aerodrome, Manchester.

Phone: Bramhall 63.

PHILLIPS & POWIS AIRCRAFT (READING) LTD.

SOLE DISTRIBUTORS OF
DE HAVILLAND AIRCRAFT
FOR THE MIDLANDS.

Prompt Deliveries.
Deferred Terms.

Exchanges.

Offer the following aircraft:—

£185 WESTLAND WIDGEON.—New C. of A. 28 hrs. since engine top overhaul.

£260 AVRO AVIAN HERMES.—Completely overhauled. 12 months' C. of A.

£280 AVRO AVIAN CIRRO III.—Hours flown since new, 270. Just completely overhauled and modified up to date. 12 months' C. of A. Compass.

£325 GIPSY I MOTH, Wooden.—Special faired-in fuselage and small centre section tank. Extra tank. C. of A. Jan./34. Engine modified and completely overhauled. High cruising speed.

READING AERODROME. SONNING 114/5

BLACKBURN BLUEBIRD. MARK IV.

AUTO-AUCTIONS, LTD., World Distributors. Have for disposal second-hand machines, fitted with Gipsy and Hermes engines. Prices from £250. Particulars of new machines on request. Side-by-side seating, all-metal construction. Horseferry Road, Westminster, S.W.1. Phone:—Victoria 8781.

COMPER SWIFT (Pobjoy), semi-final King's Cup, 1933, £450. "Bristol" Fighter, Falcon III, 3-Seater, £175. "Bristol" Fighter, Falcon III, 2-Seater, £150. Ideal joy-riding. 12 months' C. of A. 5 Others (under construction). Offers invited. —COMMERCIAL AIRWAYS LTD., Abridge, Essex.

SECOND-HAND POBJOY, latest type, new condition, with all accessories, 30 hours only. Price £125.—F. G. MILES, Reading Aerodrome, Woodley.

AIRCRAFT WANTED

WANTED, all Types of used Aircraft, for cash. State full particulars and Lowest Price.—Box No. 4124, c/o FLIGHT, 36, Great Queen Street, Kingsway, London, W.C.2.

FOR SALE

LONDON & PROVINCIAL AVIATION CO., The 3, Thackeray Street, London, W.8. The Aviation Shop (BEHIND BARKERS). For all aviation requirements.

Kindly mention "Flight" when corresponding with advertisers.

Air Service Training Limited

THE LEADING AERONAUTICAL TRAINING CENTRE OF THE WORLD

■ FLYING ■ ENGINEERING ■ NAVIGATION ■ WIRELESS ■

BRITAIN'S AIR UNIVERSITY

HAMBLE, SOUTHAMPTON

AST73C

SCHOOLS

THE DE HAVILLAND SCHOOL OF FLYING,
HATFIELD AERODROME, HERTS,
OFFERS EXPERT TUITION, every comfort,
licensed restaurant, pleasant surroundings, a fine
aerodrome, and individual attention. Trial lesson
by appointment. Telephone, Hatfield 250. z

FLYING INSTRUCTION.—Trial Lesson, 10s. 6d.
Dual, 37s. 6d. per hour. Solo, 27s. 6d. per
hour.—THE HAMPSHIRE AEROPLANE CLUB, South-
ampton. 'Phone: Eastleigh 170.

PHILLIPS & POWIS SCHOOL OF FLYING
England's Most Popular School. No Entrance
Fee. No subscriptions. Five Moths. Experienced
Instructors. Trial lessons 15/-. Learn to Fly
quickly and cheaply at Reading Aerodrome. Son-
ning 114.

GRAVESEND SCHOOL OF FLYING

For expert commercial tuition
in all Branches.

GRAVESEND AERODROME, KENT.
Tel.: 1400/1.

EAST ANGLIAN AERO CLUB

★ C.F.S. INSTRUCTORS ★
Advanced Dual Aerobatics
FULLY LICENSED CLUB.
LONDON'S NEAREST AERODROME.
ABRIDGE (Nr. LOUGHTON), ESSEX
'Phone: Theydon Bois 224.

L ALL MEALS, BATH & BEDROOM. NORFOLK & NORWICH
1:1:0 WEEK-END
IN BROADLAND

MODELS AND PARTS

A. E. JONES, LTD.
The Original House for Model Aeroplanes and
Accessories. Quality always of the highest standard.
Price list free.—97, New Oxford Street, London,
W.C.1. Tel.: Temple Bar 6350.

WINDSOR and Mersey Model Aero Clubs.
Genuine Members Wanted.—The only Club
in Manchester with a Clubroom.—"THE BLIMP,"
76a, High Lane, Chorlton-cum-Hardy, Manchester.

MODEL AIRCRAFT KITS

The Model Aircraft Stores,
133, Richmond Park Rd., Bournemouth,
For all MATERIALS, BLUEPRINTS, KITS, RUBBER,
PROPELLERS, ETC.
WRITE FOR LISTS.



**Comprehensive stocks of AERO ENGINES,
SPARES, and AIRCRAFT MATERIAL in
FIRST CLASS condition available for
immediate supply.**

240 h.p. Siddeley "Puma" and Spares.
300 h.p. "Hispano Suiza" and Spares.
130 h.p. "Clerget" and Spares.
360 h.p. R.R. "Eagle VIII" and Spares.
275 h.p. R.R. "Falcon III" and Spares.
Magnetos, C.A.V. Starters, Streamline
Wires, A.G.S. Parts, etc.

WADDON FACTORY, CROYDON AERODROME,
SURREY. Telephone: Fairfield 4393.

'HERMETICOLL'

**LIQUID
ENGINE JOINTING**
makes perfect joints and saves
money. **BRITISH MADE.**
Try a 2/- tin. Post free.
PATENT MOTOR PRODUCTS Co
11, STORE ST., LONDON, W.C.1.

SITUATIONS VACANT

SENIOR DRAUGHTSMEN for Aeronautical
Work. Full details of experience, age and
salary required, to Box No. 4107, c/o FLIGHT, 36,
Great Queen Street, Kingsway, London, W.C.2.

A VACANCY occurs for a really active man as
Air-port Manager in Air Operating Company.
Minimum investment required, £500. Genuine
prospects for right applicant.—Box No. 8517, c/o
FLIGHT, 36, Great Queen Street, Kingsway, London
W.C.2.

WANTED.—CHIEF DESIGNER, wooden light
Aircraft. Chance of lifetime for right man.
Write full details experience.—Box No. 4120, c/o
FLIGHT, 36, Great Queen Street, Kingsway, London,
W.C.2.

SPARKING PLUGS. Wanted for experimental
and inspection department, a good man with
experience, assembly and test high-grade sparking
plugs. Croydon district.—Write Box No. 4122,
c/o FLIGHT, 36, Great Queen Street, Kingsway,
London, W.C.2.

ADVERTISER commencing small Joy Flight
Business. Requires Manager. Previous experi-
ence necessary. Must invest £100, returnable on
demand. State wages required till October.—Box
No. 4123, c/o FLIGHT, 36, Great Queen Street,
Kingsway, London, W.C.2.

SITUATIONS WANTED

AMBITIOUS Young Man (22), energetic, 5 years'
estate agency, requires Progressive Appoint-
ment. Adaptable, car-owner, pilot.—R, 125, Pep-
pard Road, Reading.

PUBLIC School Boy (20) urgently requires posi-
tion with Aviation concern. Member R.A.F.O.;
extensive knowledge flying activities; journalistic
and photographic ability. Two years' office ex-
perience. Quite nominal salary to commence.—
Write R. S., 4, Rugby Mansions, Kensington.

AIRCRAFT UPHOLSTERY

L. A. RUMBOLD AND CO. for Aircraft Furniture
in Elektron and M.G.7. Cabins completely
upholstered. Special work quoted.—Kingsgate
Place, N.W.6. Tel.: Maida Vale 3772.

MISCELLANEOUS

COLLECTION AERONAUTICAL BOOKS, ETC.,
wanted and for Sale.—PIKE, 102, Clapham
Road, London, S.W.9.

AVIATION BOOKS

- "Scale Model Aircraft," By JAMES H. STEVENS ... 5/6
Post Free
- "Gliding and Sail Planing," By STAMER & LIPPISCH ... 5/6
Post Free
- "Book of the Autogiro," By C. J. SANDERS and A. RAWSON ... 5/6
- "The Pictorial Flying Course," By FL.-LT. SCHOFIELD & F.-O. JOHNS ... 5/6
(Upwards 250 illustrations) Post Free
- "Fighting Planes and Aces," By W. E. JOHNS ... 5/6
Post Free
- "The Strategy and Tactics of Air
Fighting," By MAJOR OLIVER STEWART, M.C. ... 6/6
Post Free
- "Air and Aviation Law" (Civil Aviation) By WM. MARSHALL FREEMAN ... 8/-
Post Free
- "Airmanship," By JOHN McDONOUGH ... 8/-
Post Free
- "Motorless Flight," By J. R. ASHWELL COOKE ... 8/-
Post Free
- "Around the World in Eight Days," By POST and GATTY ... 8/-
Post Free
- "Learning to Fly," FRANK A. SWOFFER, M.B.E. ... 8/-
A course of elementary flying instruction. Post Free
- "Air Navigation for the Private
Owner," By FRANK A. SWOFFER ... 8/-
Post Free
- "The Aeronautical Ground
Engineer's "A" and "B"
Licences," By CAPT. S. L. COLLINS ... 8/-
Post Free
- "War in the Air, 1936," By MAJOR HELDERS ... 8/-
Post Free
- "Camels are Coming," By W. E. JOHNS ... 8/-
Post Free
- "Wings of War," By RUDOLF STARK ... 8/-
Post Free
- "Nine Lives," By JOHN TRANUM ... 9/-
Post Free

The above obtainable upon application to:

"FLIGHT" Office,

36, Great Queen Street, Kingsway, W.C.2.

FLY A POBJOY POWERED
MACHINE. THE POBJOY
ENGINE IS FAMOUS.

POBJOY

ENGLAND TO AUSTRALIA
ENGLAND TO S. AFRICA
ENGLAND TO INDIA

Save time by using the Air Mail.

HABERSHON

STRIP & SHEET STEEL

Free from defects, sound and homogeneous, supplied in coils or lengths, in hardened and tempered or in softened condition—in all respects to meet purchaser's requirements.



J. J. HABERSHON & SONS LTD
HOLMES MILLS—ROTHERHAM.

VICKERS'

DURALUMIN

Light
AS
ALUMINIUM.
Strong
AS STEEL.

MANUFACTURED IN
RODS, TUBES,
FORGINGS,
WIRE, STRIP,
SHEETS,
SECTIONS,
STAMPINGS,
etc.

**ALSO "Y" ALLOY, ELEKTRON & WROUGHT
LIGHT ALLOYS TO ANY SPECIFICATION.**

JAMES BOOTH & Company (1915) Limited.

Argyle St. Works, Nechells, BIRMINGHAM, 7.
Telephone: EAST 1221. Telegrams: "BOOTH, BIRMINGHAM"

40% lighter than Aluminium

That is one of the features of our **MAGNESIUM ALLOYS**—another is their excellent physical properties. These factors make the **MAGNESIUM ALLOYS** peculiarly suitable for numerous parts in Aircraft and Automobile work.

The Alloys can be supplied in the form of Castings, Forgings, Extrusions, etc.

PLEASE WRITE US FOR ALL PARTICULARS.

British Maxium

Point Pleasant, Wandsworth,
LONDON, S.W.18.

Telegrams :
"Ognesiuma, Put, London."

Telephone :
Putney 4807.

AT LAST SOLO

£1 per hour on Moths!

inclusive at Contract Rate (50 hours). The cheapest flying in the world. Only 15 miles from the centre of London.

DUAL £2. Ordinary Solo only £1 5s. 0d. per hour inclusive. Monthly membership £1 1s. 0d. Residential accommodation in the Clubhouse at reasonable terms.

Full particulars from:—

The Herts and Essex Aero Club,
Broxbourne Aerodrome, Nazeing, Essex.
Tel. : Hoddesdon 453.

"FLIGHT" POSTCARDS

ACTUAL PHOTOGRAPHS

Machines of the

R.F.C., R.N.A.S., and R.A.F.

Armstrong Whitworth "Atlas"
Armstrong Whitworth "Siskin"
Avro "Bison"
Avro 504K
Avro "Lynx"
B.E. 2C.
Blackburn "Dart"
Blackburn "Iris III"
Blackburn "Kangaroo"
Blackburn "Ripon"
Boulton & Paul "Sidestrander"

Bristol "Bulldog"
Bristol "Fighter"
Bristol "Scout"
De Havilland D.H.1
De Havilland D.H.2
De Havilland D.H.4
De Havilland D.H.5
De Havilland D.H.6
De Havilland D.H.9
De Havilland D.H.9a
Fairey III-D

Single Cards 6d. each, post free.

Six or more Cards 4d. each, post free.

} Cash with order.

"FLIGHT" Office,

36, Great Queen Street, Kingsway, W.C.2.
Telephones: Holborn 3211 & 1884.

Kindly mention "Flight" when corresponding with advertisers.

FLIGHT
JULY 20, 1933

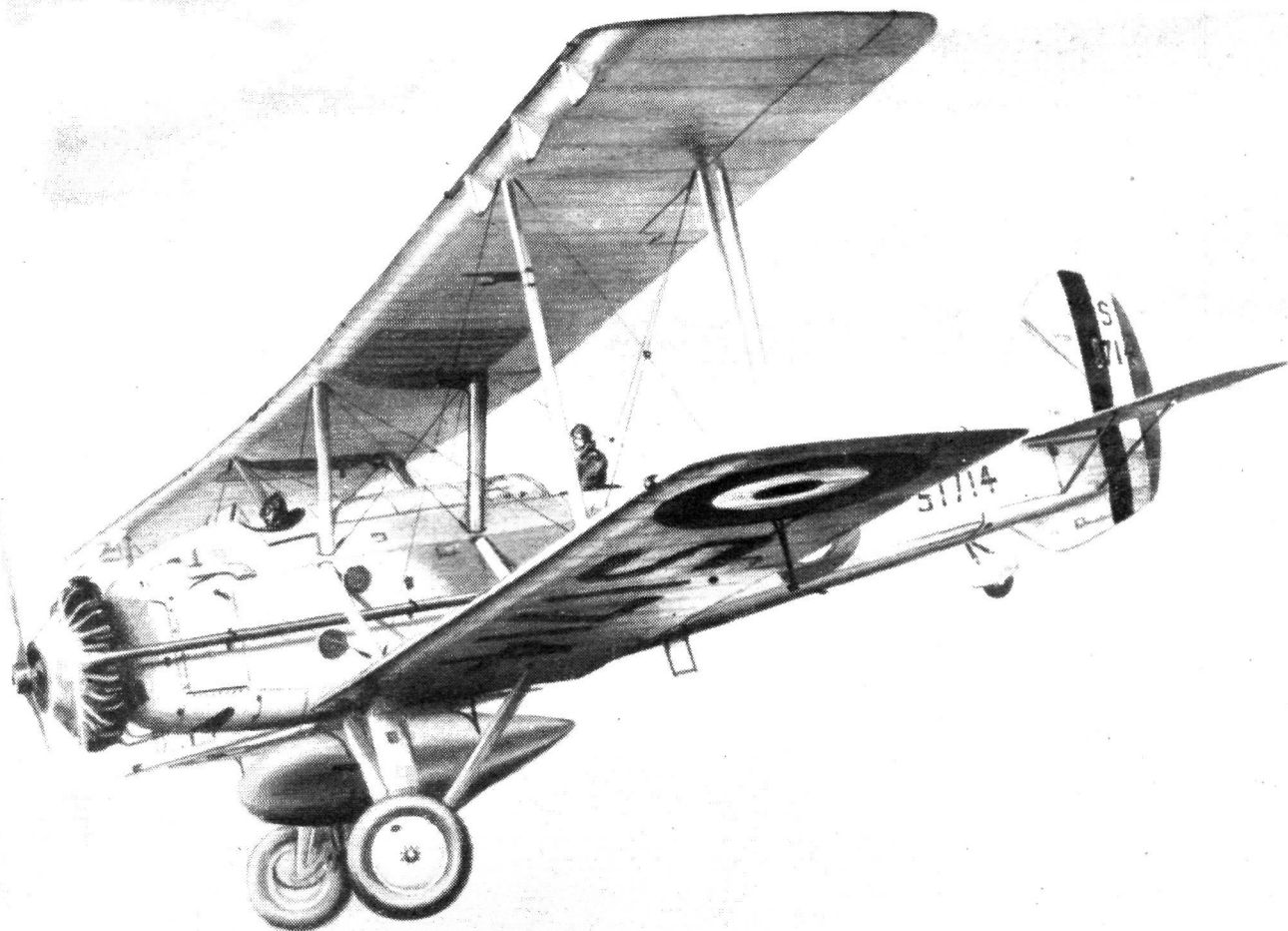
VICKERS "VILDEBEEST"

PEGASUS ENGINE

FOR "GENERAL PURPOSE" DUTIES

THE AUXILIARY FUEL TANK

INCREASES THE RANGE FROM 625 TO 1,250 MILES.

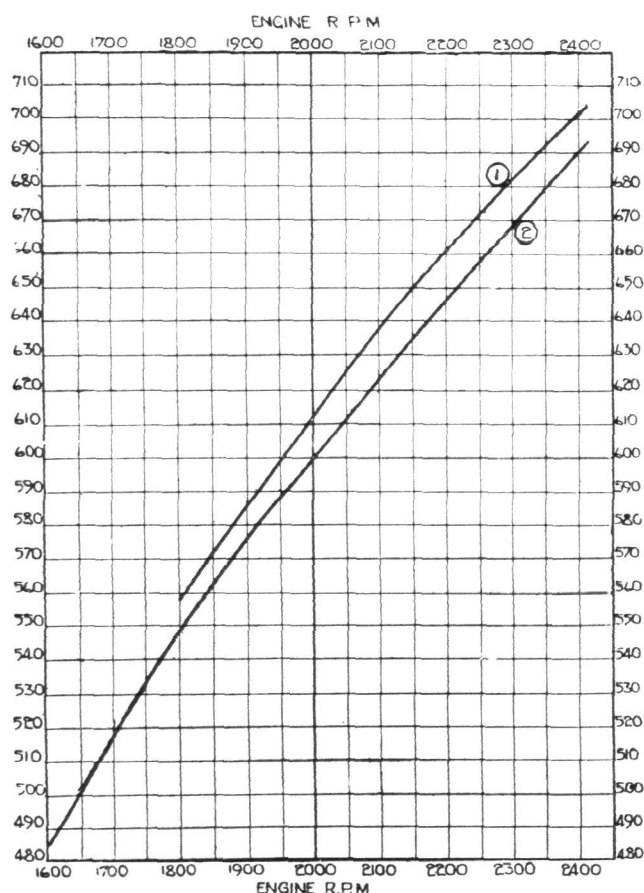


VICKERS (AVIATION) LIMITED, WEYBRIDGE, ENGLAND.

"Bristol"

50 Hours at Full Throttle and Maximum Speed.

A Striking Demonstration of the Efficiency of the Pegasus Engine.



PEGASUS II-L ENGINE. P.6001.
50 HRS FULL THROTTLE HIGH SPEED DEVELOPMENT TEST.

- ① POWER CURVE AT COMMENCEMENT OF TEST
② POWER CURVE AT CONCLUSION OF 50 HRS. FULL THROTTLE TEST AT 2300 R.P.M.

APPROVED *R. H. H. H. H. H.* 1/2 A.I.D. ENGINES DATE 10 6 33 FS 36116

A "Bristol" Pegasus "L" engine was recently subjected to a 50 hours' full throttle high speed test, developing 680 B.H.P. and running at 2,300 r.p.m. throughout, a speed of revolution 15 per cent. in excess of the rated speed. The conditions of the test were made more rigorous by the high temperature of the oil fed to the engine, which was not allowed to drop below 80° Centigrade.

Despite these severe conditions the engine ran consistently well with a negligible drop in power throughout, and a comparison of the calibration curves taken before and immediately after the test show that the drop was under 2 per cent. It is of interest that the engine, prior to reconditioning for this test, had completed approximately 500 hours running on the bench and in flight, including two official type tests and a one hundred hours' flight test in a seaplane.

This test was in accordance with the "Bristol" practice of submitting engines of each new series to a full throttle development test, believing that whereas the present standard Air Ministry type test forms a useful basis for establishing the relative performance and reliability of new types, an engine when fully developed should stand up to something more strenuous in order to ensure an ample margin of reserve.

THE BRISTOL AEROPLANE CO., LTD. — FILTON, BRISTOL.